

THE HOUSING OF SOLDIERS IN MILITARY BARRACKS  
with particular reference to Nigeria.

THESIS

by

SURAJ A. ABDURRAHMAN  
B.Sc., M.Sc. (Arch), MNIA

**EDINBURGH COLLEGE OF ART  
ARCHITECTURE LIBRARY**

Presented for the

DEGREE OF DOCTOR OF PHILOSOPHY

at the

DEPARTMENT OF ARCHITECTURE  
EDINBURGH COLLEGE OF ART/  
HERIOT-WATT UNIVERSITY  
LAURISTON PLACE  
EDINBURGH

November 1985

In memory of the Unknown Soldier  
and to my Father, in gratitude.



CONTENTS	PAGE
List of Illustrations	i.
Preface	x.
Acknowledgements	xi.
Abstract of Thesis	xii.
INTRODUCTION	1
CHAPTER 1 <u>HISTORICAL DEVELOPMENT OF BARRACK HOUSING</u>	10
THE ROMAN ARMY	11
Accommodation	15
The Marching Camp	16
Permanent Barracks - Forts and Fortresses	20
Barrack Blocks	23
The Roman Soldier	25
THE CASTLE AND FORTIFICATION ERA	28
THE BRITISH ARMY	30
Housing of Soldiers before 1945	32
Unmarried Soldiers Housing	35
Married Soldiers Housing	40
Barrack Plans	42
CHAPTER 2 <u>OTHER COLONIAL TERRITORIES</u>	52
AMERICA	53
WEST INDIES	57
INDIA	60
GIBRALTAR	64
CHAPTER 3 <u>COLONIAL WEST AFRICA</u>	69
ROYAL WEST AFRICAN FRONTIER FORCE (RWAFF)	71
GHANA	78
SIERRA LEONE	80
GAMBIA	81
CHAPTER 4 <u>NIGERIA</u>	82
NIGERIAN ARMY	83
Organization	84
Pre-1956 Barrack Housing	87
Post-1956 Barrack Housing	93
Basawa Barrack - An Example	99

CHAPTER 5	<u>CONTEMPORARY MILITARY ESTABLISHMENT</u>	109
	Military Organization	113
	Social Cohesion	118
	Barrack Housing	123
	General	128
	NIGERIA - THE EXISTING SITUATION	132
CHAPTER 6	<u>SURVEY METHODOLOGY</u>	134
	The Questionnaire	138
	Sampling Strategy	139
	Priority Evaluation Game	141
	Data Processing	144
	<u>RESULTS</u>	145
	Household Composition	145
	Educational Level Attained	145
	Number of Bedrooms in Quarters	145
	Housing Facilities	146
	Possession of Household Equipment	147
	<u>INTERPRETATIONS</u>	147
	Satisfaction and expectation	147
	Existing Housing Attributes	148
	Existing Barrack Environment Attributes	150
	Ideal Housing Attributes	150
	Ideal Barrack Environment Attributes	150
	<u>PRIORITY EVALUATION GAME</u>	154
	IMPLICATIONS	156
	Soldiers' Family	156
	Overcrowding in Barrack Housing	159
	Privacy	160
	Desired House Type	162
	<u>CONCLUSION</u>	164
	BIBLIOGRAPHY	
	APPENDIX 1 - Self Administered Questionnaire	
	APPENDIX II - Tables	

## LIST OF ILLUSTRATIONS

- 1a. Roman Legionary, painting by R. Embleton (Roman Wall educational reconstructions.)
- b. A Cavalry Trooper. painting by R.Embleton.
- c. Roman Legionaires with their Packs, painting by R.Embleton.
- d. Roman soldiers in camp. painting by R.Embleton.
- 2a. Model of Roman Tent.
- b. The Arrangement of the Century's tents within the Marching Camp.
3. The Polybian Camp.
4. The Hyginian Camp.
- 5a. The Legionary fortress at Inchtuthil, Scotland
- b. The Legionary fortress at Menss, lower Germany.
6. Plan of a typical Auxiliary fort.
- 7a. A typical Auxiliary Barrack Block.
- b. Reconstruction drawing of the interior of a barrack room (papilio).
8. Comparative plans of Auxiliary Barrack blocks.
9. Bath House at Chester Fort (UK)
10. Plan of Orange Bastion Casemates showing the overcrowding in Barrack Rooms.
11. Plan of Barrack rooms in Citadel, Fort George showing bed position.
13. Plan of Barrack rooms in Wellington Barrack
14. Plan of Barrack rooms in Houslow Barrack.
15. Plan of Edinburgh Castle New Barrack.
16. Plan of another Barrack room block in Wellington Barrack
17. Plan of rooms in Bury Barrack
18. Plan of Barrack room block in Brighton Barrack.
19. Ground Floor plan of Barrack room block in Templemore Barrack.
20. Plan of Barrack room block in Beggars Bush Barrack, Dublin
21. Plan of T-shaped Barrack blocks at Stanhope lines, Aldershot
22. Site plan of Stanhope lines in Aldershot in the late 19th century.
23. Ground and first floor plans of the company type Barrack block in the UK late 19th century and early 20th Century.
- 24a. Half battalion Barrack block (Verandah type)
- b. A company Barrack room (1900)
- c. Barrack Room (1900) in the UK.
- d. A regimental cook house UK (1900)
- e. A soldier's kit (1900)
25. typical site plans for a Brigade of Infantry in the UK (1900)
26. Site plans of Goojerat and Sobraon Barracks in Colchester
27. Site plan of Curragh-Gough and Keane Barracks (1900)
28. Military Camp in the UK (1900)
- 29a. Plan of Married soldiers' quarters, Preston Barrack (19th century).
- b. Plan of married soldiers' quarters, Beggars Bush Barrack Dublin.
- 30a. Ground floor plan of married soldiers' quarters types 'a' 'b' and 'c' (self contained with verandah).
- b. Ground Floor plan of married soldiers' quarters types 'a', 'b' and 'c' (self contained attic type).
- c. First floor (top) and attic floor (below) plans of married soldiers' quarters types 'a', 'b' and 'c' (self contained attic type).
- d. Front and rear elevations of married soldiers' quarters types 'a', 'b' and 'c' (self contained attic type).

- 31a. Ground and first floor plans of married soldiers' quarters cottage type.
- b. Section and elevation of married soldiers' quarters Cottage type.
32. Front and rear views of married soldiers' quarters in 1927 (UK) .
33. Front and rear views of married soldiers' quarters, type 'b' in 1927 (UK).
34. Different views of the Double storied Barrack room block in 1927 (UK).
35. Front and rear views of the single storied Barrack room block in 1927(UK).
36. Site plan of Hyde Park Cavalry Barrack, London (19th Century)
37. Site plan of Wellington Barrack, London (19th Century)
38. Site plan of Royal Barrack, Dublin (19th Century)
39. Site plan of Clarences Barrack, Portsmouth (19th Century)
40. Site plans of Castle and Shambles Barracks, Galway (19th Century)
41. Site plan of Linen-Hall Barrack, Dublin (19th Century)
42. Site plan of Hulme Cavalry Barrack, Manchester (19th Century)
43. Site plan of parsonstown Barrack, Parsonstown (19th Century)
44. Site plan of Naas Barrack, Naas (19th Century)
45. Site plan of Bury Barrack, Manchester (19th Century)
46. Site plan of Chichester Barrack, Chichester (19th Century)
47. Site plan of Dundalk Barrack, Dundalk (19th Century)
48. Plan and section of Barrack room block in Brompton Barrack Chatham (early 19th Century)
49. Site plan of Birmingham Cavalry Barrack, Birmingham (19th Century)
50. Site plan of Northampton Barrack, Northampton (19th Century)
51. Site plan of Sheffield Barrack, Sheffield (19th Century)
52. Site plan of Salford Barrack, Manchester (19th Century)
53. Site plan of Burnley Barrack, Burnley (19th Century)
54. Site plan of Ashton Barrack, Ashton (19th Century)
55. Site plan of Fulwood Barrack, Preston (19th Century)
56. Site plan of York Cavalry Barrack, York (19th Century)
57. Site plan of Leeds Cavalry Barrack, Leeds (19th Century)
58. Site plan of Sunderland Barrack, Sunderland (19th Century)
59. Site Plan of Fort George, Inverness (1769)
60. Site plan of Forton Barrack, Forton (19th Century)
61. Plan of Fort Fayette, Pennsylvania (1792) Issac Craig engineer.
62. Plan of Fort worth, Texas (1849), Established by Major Ripley Arnold (National Archives, Washington DC)
63. Fort Defiance, Arizona (1851). Water colour by Seth Eastman.
64. Fort Simcoe, Washington (1856). Restoration drawing by private C.M.Schultz. (1858).
65. Plan of Fort Sumner, New Mixico (1862) Plan drawn by A.J.Simpson National Archives, Washington DC.
66. Fort Phil Kearny, Wyoming (1866). Established by Colonel Carrington. National Archives, Washington DC.
67. Details of construction used for Fort Phil Kearny. Drawn by Colonel Henry B.Carrington, National Archives, Washington DC.
68. Plan of Barrack room block, Fort Phil Kearny, National Archives Washington DC.
69. Plan of Fort Laramie, Wyoming (1849). national archives Washington DC
70. Priority evaluation game.
71. Officer and detachment of a West Indian Regiment at the start of the 20th century. National ARmy musuem. London.
- 72a. Plan and elevation of Barrack block at Lucea, Jamaica (19th century).
- b. sections and elevations of Barrack block at lucea, Jamaica.

- 73a Plan and elevation of Barrack block proposed by Colonel Sir C. Smith, Royal Engineers, for West Indies.
- b. Section and elevation of Colonel Smiths Barrack block.
- 74a Plan and elevation of Officers' quarters at Demarara, West Indies (19th Century)
- b Elevation and section of Officers' quarters at Demarara.
- 75a Indian Soldiers on parade (early 20th century)
- b Indian soldiers
- 76 Indian married soldiers' quarters (1910)
- 77 Indian unmarried soldiers' quarters (1910)
- 78 Plan of Orange Bastion Casemates, Gibraltar (19th Century)
- 79 Plan of Wellington front casemates, Gibraltar (19th Century)
- 80 Plan of Twön Range Barrack, Gibraltar (19th Century)
- 81 Plan of South Barrack, Gibraltar (19th Century)
- 82 Non-commissioned officers and private, Royal Niger Hausa 1900 Nigerian Army Museum, Zaria.
- 83 Royal Niger Hausa at dinner 1900. Nigerian Army Museum Zaria.
- 84 Officer, non-commissioned officer and detachment, Sierra Leone (1900) Nigerian Army Museum Zaria.
- 85 Preparing swish blocks, West Africa (1945). Royal Corps of Engineers Library, Chatham.
- 86 Preparing sandcete blocks, West Africa (1945) Royal Corps of Engineers library, Chatham.
- 87 Soldiers' dining hall, West Africa (1945) Royal Corps of Engineers (R.E.) Library, Chatham.
- 88 Soldiers' round house type - renewing grass thatch, West Africa. R.E. Library, Chatham.
- 89 Roudn houses, before and after shingling, West Africa.
- 90 Officer's round house with swish walls, bamboo and grass roof replaced with shingles, West Africa.
- 91 Interior of Lagos-type officers' mess showing tukarua partitions, zana matting ceiling and mosquito proofed verandah with internal windows omitted for coolness. West Africa (1945).
- 92 A british non-commissioned officers' mess showing Lagos-type framed hutting. West Africa (1945).
- 93 An Officer living hut in Gambia showing wattle and daub walls (1945).
- 94 An office building in Gambia showing building on rhun palm 'stilts' with split rhun palm framing filled in with wattle to be finished with mud daub (1945).
- 95 Soldiers' rectangular type mud house constructed with swish walls, bamboo and thatch roof. West Africa (1945).
- 96 Soldiers' old type Ark hut constructed using bamboo frame and grass matting. West Africa.
- 97 Soldiers' round house type with bamboo and grass thatch West Africa (1945).
- 98 Soldiers' round house type stripped for new roof.
- 99 Soldiers' quarters in Lagos lshowing tukarua cladding to timber framing (1945).
- 100 Officers quarters in Lagos - Lalgos-type hutting showing mosquito lock and ridge ventilation (1945).
- 101 Ark type hut - plans and elevation.
- 102 Soldiers' Ark type house under construction. West Africa.
- 103 Soldiers Ark type house constructed with timber frame.zebri mat walls and shingle roof. West Africa (1945).
- 104 Office building constructed with timber showing felt roof treated with cement and lime wash to deflect sun. West Africa.
- 105 Lagos-type huttingused in the construction of an officers' mess in Lagos, Nigeria. (1945).
- 106 Lagos type hut - plans and sections.
- 107 Soldiers of the Nigerian Regiment mounting a Guard of Honour for Her Majesty the Quen during the Royal tour of Nigeria 1956).

- 108 Plan of single officer's quarters - Basawa Barrack
- 109 Warrant officers and sergeants' quarters - Basawa Barrack
- 110 Plan of soldiers' 12-family Barrack block - Basawa Barrack
- 111 Communal toilets in soldiers' housing, Nigeria (late 1950's)
- 112 Soldiers' 12-family block housing Nigeria (late 1950's)
- 113 Warrant officers and sergeants' housing, Nigeria (1960)
- 114 Kitchen for the soldiers, Nigeria (late 1950's) )
- 115 Row of rectangular barrack blocks built in the early 1960)
- 116 Row of 3-storied barrack blocks built in the 1980's Nigeria
- 117 30-family barrack housing block built in the early 1960's
- 118 30-family soldiers' barrack housing block built in the 1970's
- 119 The space outside the barrack block - old blocks.
- 120 The space outside the barrack block - new blocks.
- 121 Plan of a 35-family soldiers' housing block, Nigeria (1980's)
- 122 The barrack environment - Basawa Barrack
- 123 The layout of barrack blocks - Basawa Barrack
- 124 Soldiers' quarters built in 1958, Nigeria.
- 125 Front view of barrack block in 124.
- 127 Eradicate illiteracy campaign. SOJA August
- 128 Two letters from soldiers to the editor of the Army magazine  
- SOJA June 1980
- 129 The space between two blocks.
- 130 Row of 36-family barrack blocks built in the 1980's Nigeria.
- 131a Director of fortification works' Barrack room block (pitched  
roof type) built all over the UK in the 1950's
- 131b Director of fortification works' block - flat roof type
- 132 Plan of a basic modular suite, UK 1983
- 133 The closed modular suite for four men UK (1983)
- 134 Plan of 4 modular suites combined.
- 135 Barrack room in the U.S. army in the early 1940's)
- 136 Accommodation for soldiers of the U.S. Army Anti-Aircraft  
Command (ARACCom) in the 1940's
- 137 ARAACom Soldiers' accommodation 1956.
- 138 Barrack block for soldiers (US Army in the 1950's
- 139 Interior of the Barrack block referred to in 138.
- 140 Barrack Block in a U.S. Military installation (1984)
- 141 Interior space for a soldier in a 4-man room of 12-man flat.
- 142 A recent development of the 18-man flat at Wellington Barrack,  
London.



## PREFACE

Little formal research in this area has been conducted in the past. This study must therefore remain essentially exploratory and some of the author's interpretations and conclusions will no doubt have to be elaborated in the future. It is intended that this study will prove useful to Architects, Planners and Military Authorities concerned with Military Housing, particularly in Developing Countries, in achieving better housing solutions for the soldiers in order to improve morale and commitment to the service of an efficient Military. There is need for Designers to collaborate with Military Specialists to translate the new ideas in military thinking into effective building design. This collaboration is desirable and is beneficial to both the Designers and the Military Authorities.

### Biographical note about the author.

The author's concern in the living conditions of soldiers dates back to his years in College as a member of the College's Army Cadet Force. After college, he entered the Nigerian Defence Academy with the 14th Regular Course and was commissioned 2½ years later as an officer into the Nigerian Army Engineer Corps. Since then, throughout his years in the University and after, he has always taken a very keen interest in the soldiers' housing.

ACKNOWLEDGEMENT

I wish to express my thanks to many people who have helped me at various stages of this research. Firstly, I am deeply grateful to Professor James Dunbar-Nasmith, my tutor, who gave me the freedom to develop my ideas, went over my writings and encouraged me throughout the period of the research. I am also grateful to Dr. Peter Aspinall and the staff of the computer department in Grassmarket; the staff and post-graduate students of the architecture department for their criticisms and advice during and outside the seminars held in the department; the Commanding Officers and men of the Nigerian Army (NA) units, for allowing me time to interview some of them; Brigadier M.T. Kontagora (NA), Colonel Unimna (NA), Lieutenant-Colonels J.M.Madaki, Ukpo, and Kupolati (NA), Major U.K. Bello (NA), Captains L.K. Are and T.O. Umar (NA), Colonel C.D. Boyd III (U.S. Army), Mr. James Boyle (U.S. Army), Commander George Somers-Hall (Royal Navy), Colonel Bob Hay (retired), Architect John Wilson (PSA), Mr. Iain McIvor and Mr. David Walker (SDD), Officers of the Quartering Department of the Nigerian Army Headquarters, Staff of the Architectural Department of the Office of the Chief Engineer (U.S. Army in Washington DC), and Architect M.B.Ojoko, my friend and colleague, for their knowledge and advice. I also wish to express my gratitude to Mr. Tom MacVitie and staff of the Property Services Agency (PSA) library in Edinburgh, Miss Norris and staff of the Royal Engineer Corps Library in Chatham, the National Army Museum in London, and the Nigerian Army Museum in Zaria, for their tremendous efforts in providing a large part of the material used for the research; Mariam, Suraj Jr., Abdujabbar, Abdulaziz, and Abdulmalik Abdurrahman, my wife and children who must have suffered a great deal at the expense of this research; and finally, to the Nigerian Army, who awarded the scholarship and gave me study leave for the research.



## ABSTRACT OF THESIS

The research traces the housing of soldiers in Military Barracks from the time of the Roman Army, and by examining the Contemporary Military Establishment, identifies the changes that have occurred.

It notes the advancement in the technology of warfare which necessitates the recruitment of a higher calibre of men into the Military.

The survey methodology establishes the use and nature of the questionnaire and the priority evaluation game which was developed to obtain the soldiers' housing priorities. The data collected by the survey from a sample of soldiers is analysed, in order to understand their attitudes towards existing Barrack housing and to identify their expectations in an ideal Barrack housing.

The findings show a general dissatisfaction with the existing housing and a preference for the semi-detached house with private backyard. Furthermore, the result indicates that the individual's dissatisfaction with the existing housing is associated with his level of education.

The implications resulting from the majority of soldiers now being married are discussed so far as the provision of satisfactory living conditions for troops and their families affect morale and loyalty.

Such barracks are expensive no doubt..... so are sick soldiers, so are dead soldiers. But the difference of these expenses is that the first is once and done with, the second goes on increasing like compound interest and quickly outstrips the capital.

Sir Charles Napier in India.

## INTRODUCTION

We are busy that we may have leisure and make war  
that we may live in peace.

Aristotle

Although armed forces are as a rule National Institutions, the forces of different Nations are very similar in structure and function. They all tend to have the same values and norms of behaviour; they form a community that encompasses the work and life of their members much more completely than do most other organisations; they also resemble each other in rank system and organisational pattern, technology and training programmes, rituals and life styles. The reason for this lies in the similarity of their functions and their historical development. The standard model which came into being in the eighteenth century, was exported throughout the world by Europeans through their Colonial armies and later was adopted by the armed forces of new Nations. The Military was then a simple organisation, in which the emphasis was put on reducing everything to fundamentals. By standardizing actions (drills, routines, etc), and directing movements from a central point (through a vertical hierarchy), a social machine was constructed that was well integrated and capable of absorbing external shocks. However, development in the technology of warfare, which has increased range and destructive power of weapons, and changes in the level of soldiers' skills, has forced adaptations in the structure of military organisations.

The early history of the military reveals scant concern for the welfare of the soldier and even less for his wife and children. What little there was tended to be concentrated on the physical essentials of a fighting force.

It resulted in a military, largely unmarried, predominantly male, with Barracks designed for maintenance of unit integrity, and a focus on the unit for pay, promotion and personnel actions. The men had a Barrack or unit oriented life style off-duty, low wages, but with substantial compensation in kind, shared societal norms of individual fulfilment through commitment to hard work and acceptance of living compatible with the income of a single family breadwinner. Obviously, many of these are no longer part of today's scene. Changing values, attitudes and traditions are straining relationships between the Military and Society, and between the Military and the Soldier. Most military plans, geared for the present or the future, seemed to assume that although the individual soldier would have to operate with changing technology, function in different organisational frameworks, and exist in different parts of the World, he himself would be an unchanging element. This assumption does not conform to the growing body of knowledge in the social and behavioural sciences which identifies man as a dynamic complex being. The Technological advances on the battlefield have brought with them added responsibility for the soldier. Each new weapon enables the soldier who operates it to influence a large portion of the battlefield. With one shot, a million pound tank can be destroyed by a single soldier. With that kind of responsibility the soldier remains the ultimate weapon. In considering all dimensions of military modernisation, it is quite clear that the human factor is the most challenging problem the military faces. No matter how awesome the arsenal it is about to field, the most important element is the soldier.

many

non nuclear

Patton comments that "Wars may be fought with weapons, but they are won by men. It is the spirit of men who follow and of the man who leads that gains the victory." <sup>1</sup> All armies therefore need to keep the morale of their soldiers high, they need to be well trained, mentally sharp, sufficiently educated, innovative, yet intelligent enough to recognise that only disciplined application of collective efforts can bring about the attainment of organisational objectives. Experience in war and the documentation provided by military history lead inevitably to the conclusion that a force which has low morale and lacks good discipline will take a heavy defeat from that which has them. The improvement of the soldier's morale involves the satisfaction of his needs and those of his family. Maslow <sup>2</sup> formulated a pattern of human needs that remains relevant today. What is called the Maslow Hierachy is a pyramid, with the basic human physiological needs of food, water, sex and shelter forming the base. At the next level is physical security, the needs of personal development and accomplishment. Once these essential needs are met, man could then concern himself with societal needs—love, companionship, patriotism, nation. These needs are listed in the order of their importance to the individual and the individual ability to meet higher needs depends on the extent to which he is able to satisfy the more essential needs. Thus without the satisfaction of the soldier's needs, the search for higher organisational objectives will be frustrated, and the resultant military only a shadow of what it might be.

1. General George S. Patton Jr, War as I Knew It (London: WH Allen, 1949) p.38.
2. A.H. Maslow, Motivation and Personality (New York; Harper and Brothers, 1954).

Human nature, it is often said, does not change. But it can be argued that human behaviour and expectations change with social patterns.

<sup>3</sup> Military Housing based on this premise could help the military conserve its energy by avoiding upstream swims against the social tide. The problem is as to how the military, which must remain essentially oriented to the harsh environment of the battlefield, identify and plan for the social and behavioural factors which determine the essential non-combat relationship between itself as an organisation and the soldier as an individual member of society. It must be realised that the discipline which makes the soldier of a free country reliable in battle is not to be gained by harsh and tyrannical treatment. On the contrary, such treatment is far more likely to destroy than to make an Army, particularly today that most Military establishments are operated on a volunteer concept. This concept has been the impetus for many serious examinations of the quality of military life. "We pay our men so wretchedly that we can only hope to entice men to enlist by making them happy whilst they are with us and the first step towards happiness is to make men's dwellings bright and cheerful." <sup>4</sup> One of the commonest errors in the discussion of Military matters, is the belief that as the soldier is, so he must always be. Traditionally, he was thought to come from a class whose idea of refinement and comfort is elementary, and whose surroundings are often squalid. He is like other men, he is willing to work hard, to endure discomfort, and even hardship when the necessity arises.

3. A. Rapoport, House Form and Culture (New Jersey: Prentice-Hall, 1969) p.5

4. Field Marshal Viscount Wolseley, quoted by Major Scott-Moncrieff R.E., Occasional Paper VII in the Corps of Royal Engineer Professional Papers, 21 (1895) p.133.

Those who have seen him in the field living in trenches, or sleeping in open air, and who have observed his cheerful demeanour and his unwavering fortitude, know that he can dispense with the luxuries of life, but he would rather enjoy them, and in this respect he is like the rest of mankind.

Today, most armies offer good pay and good prospects to any man of good conduct and intelligence who joins them. These are great attractions, and will have their effect. But the result will be retarded unless and until it goes hand in hand with good housing, necessary amenities and pleasant surroundings. When all these advantages are combined they will attract the right calibre of personnel to meet the demand of the Military's growing sophistication. It is essential therefore that the Barrack Housing is attractive not merely to those who have been accustomed to enlist, but also to those whom the military hopes to bring to and keep with the colours and to whom service does undoubtedly offer a good and well-remunerated career.

In Nigeria, there has been some progress in the career development of the soldiers, particularly the introduction of the compulsory literacy campaign aimed at improving the educational standard of the soldiers. Masland and Radway<sup>5</sup>, and Janowitz<sup>6</sup> have documented each in their own way, that education plays an increasingly important part in the career development of soldiers. Education is broadening the soldier's perception of his world, he is more aware of what he wants and why he wants it.

5. J.W.Masland and L.I. Radway Soldiers and Scholars (New Jersey: Princeton University Press, 1957) pp.25 - 60.

6. M.Janowitz, The Professional Soldier (New York: Free Press, 1960) pp 99-133.

The growing awareness of and respect for other places and societies is replacing older prejudices and loyalties. Hence in an era when resources of all types are becoming more scarce and when competition for competent, motivated manpower grows more fierce, the Military must plan better for its human resources.

Barracks in themselves are not monolithic and undifferentiated but are composed of various sub-environments which have considerable impact in themselves on the soldiers and also in the larger Barrack environment. Barrack Housing is one such sub-environment, where the soldiers spend much of their off-duty time with their families and is the setting in which a large proportion of inter-personal learning and peer influencing occurs. Although some attempts have been made in housing research for civilian members of the Nigerian society, no attempts have been made to measure and assess the preferences of the soldier toward his quarters in the face of the changes within the Military. Thus the designers of Soldiers' environment have little more to rely upon as a basis for their decisions than their own set of values which are often unrelated to those of the soldiers for whom they design. New Barrack Housings in many cases retained the defects of the old. Bauer<sup>7</sup>, writing about "lack of positive instruction for Consumer, and the dearth of objective knowledge about people's housing needs and wants", noted that "what the planner wants to know is the scientific effect of a particular factor in the environment over which he has some bona fide control, the interrelation between one factor and another..... Also he needs to know what to do, not merely what to avoid."

7. Catherine Bauer, Social Questions in Housing and Town Planning (London: University of London Press, 1952) p.20.



This statement, although made with American and Europe's social milieu in mind, is just as valid and relevant to Nigeria's situation today.

However, the provision of Barrack Housing for soldiers, the siting of Barracks and deployment of units is, ultimately a large scale financial exercise. Economies will always be sought and, perhaps, one of the greatest difficulties is to find an acceptable compromise when on the one hand there are intangible factors such as morale, efficiency and discipline and, on the other, more measurable ones such as the existence of assets and the value of the land. For example, it is difficult to measure in money terms things which might result from more effective Barrack environment such as; improved recruiting figures, effectiveness of the soldier when he and his family are contented, and the value the military gets from its training programmes. Cost benefits of this nature are not included in this research, but are nevertheless part of the total problem. At each annual budget, the planners, analysts and civilian and military leaders focus on hardware-oriented military capabilities and the readiness of the military to carry out its combat objectives. Budget items not directly coupled to readiness are often vulnerable. The lack of solid data has not only made it difficult to define the requirements, but also made it difficult to defend resulting programmes in competition with programmes more obviously related to readiness. Furthermore, even though the military family as a class is unique, and even though there are millions of military families all over the world, very little formal research in this area has been conducted.

The present study is therefore essentially concerned with identifying and understanding the Barrack housing and environmental dimensions with which the soldiers feel satisfied or dissatisfied and their preferences. ✓

There is also interest in discovering the significance of the soldier's level of education in relation to how critical he is of his living conditions. The hypothesis presented assumes that the higher the educational attainment of the soldier, the more critical he is of his living conditions and that the life style in his socio-cultural background influences his preferences. This objective is intended to provide both the Designer and the Military authority a basis for better designs of Barrack housing that will improve the state of morale and commitment to service of the individual soldier which will ultimately result in a more efficient Military. It will also serve as a useful spring-board for further research in this area. ✓

An attempt is made to trace the historical development of Barrack housing which has not previously been done. The assumption behind any historical approach is that one can learn from the past; that study of the past is of value philosophically as well as in making us aware of the complexity and overlapping of things. It can also clarify those elements that are constant and those that change. "We need the rich time dimension to help us avoid the all too common triviality of living in the moment, as a continuous prelude to rushing thoughtlessly into the future." <sup>8</sup> Hence a sudden break with all that went before cannot be assumed, or that the existing problems are so different that the past has no lessons for the present. While technology may progress, architecture does not necessarily do so. However, architecture has always been a powerful instrument for enhancing various types of orders. For example, when an architect plans and designs a housing estate, he implicitly creates a relationship between human beings, their activities and the inter-association of those activities. ✓

8. G.E. Hutchinson, Knowledge Among Men, in S.D. Ripley, editor, Smithsonian Institution Symposium (New York: Simon and Schuster, 1966) p. 85.

Through his achievement, he exercises a considerable influence on the future socio-psychological climate of such an estate.

By looking at the contemporary military establishments, the changes that have occurred through the years are identified. The survey methodology then establishes the use and nature of the questionnaire and the priority evaluation game which has been developed to obtain the soldiers' priorities. Thus through the survey of the sample of soldiers, data is collected about their preferences, expectations and evaluation of existing Barrack housing and its environment. The results are then analysed to explore the attitudes of the soldiers. Finally, the conclusions and implications of the findings are discussed.

## CHAPTER ONE

### HISTORICAL DEVELOPMENT OF BARRACK HOUSING

It is probable that in the early days of the wandering tribes, conflicts were relatively few because the population was small and the natural resources large; but as the city states grew up in relatively close proximity, causes of dispute increased and wars became frequent. When they occurred, fighting men were raised from amongst the citizens, for the inhabitants of any state accepted that they had a duty to defend it by actual service in the field. When these citizens were called out to fight, there was no time to give them much training, so tactical concepts and movements were necessarily of the simplest. Detailed military knowledge dates back to the rise of the first Mediterranean civilization about 2000 BC. By about 1000 BC, the Greeks had become dominant and in 146 BC, the Greeks were defeated by the Romans. <sup>1</sup>

1. Graham Webster, The Roman Imperial Army of the 1st and 2nd Centuries AD (London: Adam and Charles Black, 1969) p.5.

## THE ROMAN ARMY

The Roman army is considered the earliest known highly Organised Army.<sup>2</sup> It started with men who were recruited each year as part time Soldiers. But by 106 BC, it was reorganised and the Soldiers had become full time professionals. The army won for Rome an Empire, which by 100 AD stretched from Scotland to Syria and Egypt. It was initially composed almost entirely of legionary soldiers, Roman citizens, the heavy armed infantry whose skills and discipline had laid the very foundations of Rome's empire. Increasingly, though, use had been made of other, non-Roman troops who were specialists in other branches of warfare, especially cavalry fighting. These non-legionary regiments were known as Auxiliaries (auxilia) and they were later organised as an integral part of the Roman Army. The army consisted of 30 legions of about 5000 men each; 140,000 Auxiliary Infantry troops, 80,000 Auxiliary cavalry and 10,000 irregular troops from Allies.<sup>3</sup>

Each Legion was divided into ten Cohorts of about 500 men. A Cohort consisted of six Centuries and a Centry of ten Tents. Each Tent had eight men. The Commander of the legion (Legatus Augusti legionis) and his second-in-command, the senior Tribune (tribunus militum legionis laticlarius), were not long-serving professional soldiers but were rather administrators of senatorial rank, in their thirties and twenties respectively, to whom a legionary appointment represented a step-up the promotion ladder of the Imperial Service.

2. Webster, The Roman Imperial Army, p.46

3. Peter Hodge, The Roman Army (Essex: Longman, 1977) p.2

There were also five junior Tribunes at the legionary headquarters. The Senior experienced army officer was the Camp Prefect (praetectus castrorum), the third-in-command, who was a former Centurion and had spent his whole career in the army. He bore considerable responsibility for the administration of the legion, and supervised all its engineering construction and industrial projects. The Centurion commanded a centry of eighty men and was responsible for leading them into battle and for various day-to-day administrative jobs in the Camp (keeping discipline and punishing soldiers who stepped out of line).

The ordinary legionary or common soldier was the backbone of the legion. Each legionary was issued with the same dress and weapons: helmet, breast-plate, greaves, boots, a rectangular curved shield, two metal tipped javelins, a double-bladed sword and a dagger (fig.1). In addition each man carried food ration, cooking pot, spade, stakes for building a camp, a hammer and a bag of nails and a military cloak which could be used as a blanket. The legion contained vast numbers of other men besides the soldiers who served the army in the field. They included bakers, cooks, orderlies, armourers, carpenters, blacksmiths, waggoners etc. There were also priests, doctors and musicians attached to the army. On oversea campaigns, the army was supported by a fleet of marines which transported their equipment, horses and supplies across the sea.

Auxiliary soldiers were usually non-citizens (peregrini) from the provinces who received a grant of Roman citizenship for themselves and their families upon discharge after twenty-five years' service. The auxilia were composed of units which consisted either entirely of Cavalry (alae) which were most prestigious in terms of status and pay, infantry (cohortes peditatae), or a combination of the two (cohortes equitatae).

Having been raised, the new Auxiliary unit was sent away from its homeland to serve elsewhere in the empire. Its regional identity became quickly submerged, as new recruits usually came from the province in which the unit was normally stationed, perhaps the only remaining link with the original recruiting ground being the garrison's name. The Auxiliary Cavalry were organised into units called Wings of 500 and 1000 men, under the command of a Prefect (praefectus). Each Wing was usually divided into sixteen or twenty-four Squadrons, which were commanded by Decurions. The Auxiliary Infantry were also organised into Cohorts of 500 and 1000 men. Each Cohort was commanded by a Roman officer, a Tribune for a 1000-man Cohort, and a Prefect for a 500-man Cohort. The Cohorts, each, consisted of six or ten Centuries, with a Roman Centurion in charge of the Century.

One of the best descriptions of the Roman Army at war is given by Josephus<sup>4</sup>, who had the advantage of seeing it at close hand from both aspects, those of an enemy and an ally of the Romans, having at first fought against them but, after being captured, won over to their service. Their success is due, he says, to the firm discipline, constant drill and battle practice by which they became hardened to war and skilled in the use of new weapons. He was impressed by their discipline and order in the camp - "... they live together by Companies with quietness and decency, as are all their other affairs managed with good order and security.

4. Flavius Josephus, The Wars of the Jews, translated by William Whiston (London: J M Dent & Sons, 1915) P.45; Webster, The Roman Imperial Army, p.15.

Each Company hath also their wood and their corn and their water, brought them when they stand in need of them; for they neither sup nor dine as they please themselves singly, but all together. Their times also for sleeping and watching, and rising, are notified beforehand by the sound of trumpets, nor is anything done without such a signal;..."<sup>5</sup> The Roman armies being frequently at a great distance from their own country, and in the midst of their enemies, a consciousness of the common danger and of their dependence upon one another for safety, may be supposed to have increased the mutual affections of the whole, from the Commander downwards. For, among mankind, the bond of friendship becomes stronger as the danger to which they are jointly exposed increased.

5. Josephus, The Wars of the Jews, P.45



### Accommodation

The Roman Soldiers occupied a marching camp, a permanent fort or fortress, according to circumstances. The marching camp was set up during a campaign when the troops carried their leather tents with them. They were usually occupied for only a short time and the whole army group was encamped together, auxiliaries with legionaires. The fort normally housed a single unit, while the fortress houses the legionary establishments on permanent basis.

## The Marching Camp

When the Roman Army went on Campaigns the soldiers slept in leather tents. Each Legionary Century occupied eight tents, which were pitched in a long line. Each tent measured 10 Roman feet square and accommodated a Tent group (contubernium) of eight men. Only eight tents were needed per Century as a group of sixteen men was posted on guard duty. A space equivalent to two tents was allocated to the Centurion at the end of the tent row (fig.2). Two lines of tents were drawn up facing one another across an open space 28 Roman feet wide, allowing enough room in front of each row for the piling up of arms and equipment and the tethering of baggage animals.

The earliest surviving description of a marching camp is given by Polybius, <sup>6</sup> writing in the middle of the second century BC, who details the accommodation required by two Legions with their associate Cavalry and Allied troops. Another account was given by Hyginus <sup>7</sup> in the third century AD in which the Camp accommodates three Legions, Auxiliary Cavalry and Infantry, and other irregular troops. Despite being written five hundred years apart, both accounts are still comparable, with differences in details reflecting, in general, the changes in the organisation of the Army itself during such a period.

6. E. Fabricius, 'Some notes on Polybius' Description of Roman camps' in Journal of Roman Studies, 22 (1932) p.78 and F.W. Walbank, A Historical Commentary on Polybius (Oxford: OUP, 1957)
7. Webster, Roman Imperial Army, P.65.

The Polybian Camp (Fig 3) designed for two Legions and a full compliment of Allied troops (totalling 16,800 Infantry and 1800 Cavalry) was square with sides 2017 Roman feet. The General's tent (praetorium) was the focal point. From it the allocation of space was carried out. In front of the praetorium lay the tents of the twelve Legionary Tribunes, six from each Legion. The Camp was traversed by three major streets. The main street (principia) ran in front of the Tribunes' tents and was 100 Roman feet wide, and parallel to it in the front part of the Camp lay a second street only half as wide, known as the via quintana. Running along the central axis of the Camp at right angles to them was another street 50 Roman feet wide which divided the space in front of the praetorium in two; each half accommodated the tents of one Legion and those of its Allied Cavalry.

Polybius tells us that the main fighting unit of the army in the second century BC was the maniple, which was the equivalent of two Centuries. Each Legion comprised thirty maniples, divided equally into three lines of battle, the younger recruits (hastati), the more experienced fighting men (principes), and the tried veterans (triarii). These divisions were retained in the Camp layout, where the Legionary Cavalry lay adjacent to the central road and behind lay the tents of first the triarii, then the principes and finally the hastati. On the outside, nearest to the defences, were quartered the Allied Cavalry and Infantry.

On each side of the General's tent lay the quaestorium and the forum, which were flanked in turn by the tents of the Cavalry (extraordinarii equites) and Infantry who accompanied the General and his staff on the march, and acted as a bodyguard. Behind them lay the remainder of the extraordinarii equites and pedites, and all the other irregular allied forces accompanying the Legions.

All round the Camp between the rampart and the tents lay an open space, the intervallum, which was 200 Roman feet wide and designed to give good access for the troops, to accommodate booty and cattle, and to ensure that the tents were pitched well out of the range of burning missiles.

The Hyginian camp (fig 4) designed for three Legions and assorted Auxiliary units (estimated at approximately 40,000 men), was rectangular in shape with rounded corners, measuring 2320 x 1620 Roman feet, and so was much more crowded than the polybian example. The principal street, the via principalis, was 60 Roman feet wide and extended across the width of the camp, with gates at either ends, the porta principalis sinistra and the porta principalis dextra. The two other gates, set in the centre of the shorter sides of the camp, were the porta praetoria, which lay nearest to the enemy, and the porta decumana, at the rear of the Camp. A space 720 x 180 Roman feet was allocated for the General's quarters, the praetorium, which occupied a central position fronting onto the via principalis. This street, together with another running parallel at the rear of the praetorium, the via quintana, 40 Roman feet wide, divided the camp into three parts. The central portion (latera praetorii) comprised the praetorium, the auguratorium for religious sacrifices, the tribunal from which the General addressed his men, and the tents of the General's personal staff and those of the praetorian troops, which were flanked on the outside by the first cohort and vexillarii of one of the Legions in garrison.

The front part of the camp, from the via principalis to the front gate (porta praetoria) was termed the praetentura, in which were drawn up first, fronting the main street, the tents of the legionary legates and tribunes together with the scholae or meeting places of the first cohorts, then the Auxiliary alae, the hospital (valetudinarium) for soldiers, the

veterinarium for sick horses, the workshop (fabrica) and the quarters of the various companies of marines, pioneers and scouts. The Legionary Cohorts, being the most trustworthy, were drawn in lines nearest to the rampart around the perimeter of the camp, encircling the tents of the Auxiliary soldiers.

The rear third of the camp was known as the retentura, which accommodated the quastorium of the Camp Prefect, where booty and prisoners were kept, together with an assortment of Auxiliary troops. Legionaries were again accommodated adjacent to the rampart. The intervallum was 60 Roman feet wide, with a street, the via Sagularis, close by running all around the inside of the camp. Ancilliary streets between the tent rows (viae vicinariae) were 20 Roman feet wide.

Such standardised plan was vital when dealing in a single overnight camp with such large numbers of men and animals as those described by Polybius and Hyginus. It was essential that, whatever the nature of the ground, the layout should remain constant so that each unit, and indeed every individual, would know exactly where to pitch their tents with a minimum of delay and confusion, especially if under threat of attack. Organisation was equally important when breaking camp, and the accommodation of the various Legions and Auxiliaries was arranged in a way which would allow them to break camp in marching order.





1a. Roman Legionary





16. A Cavalry Trooper



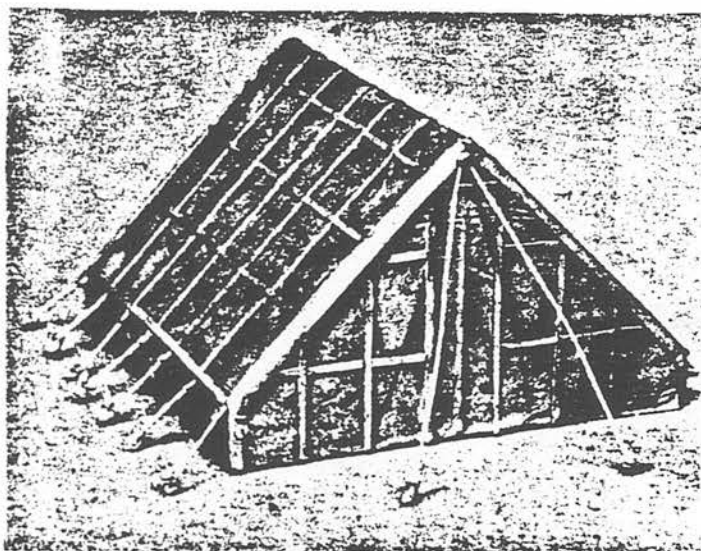


1c. Roman Legionaries with their Packs.

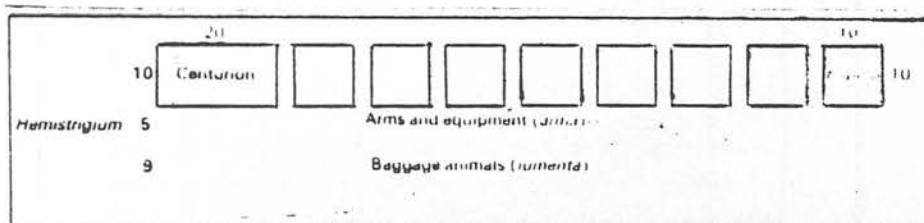




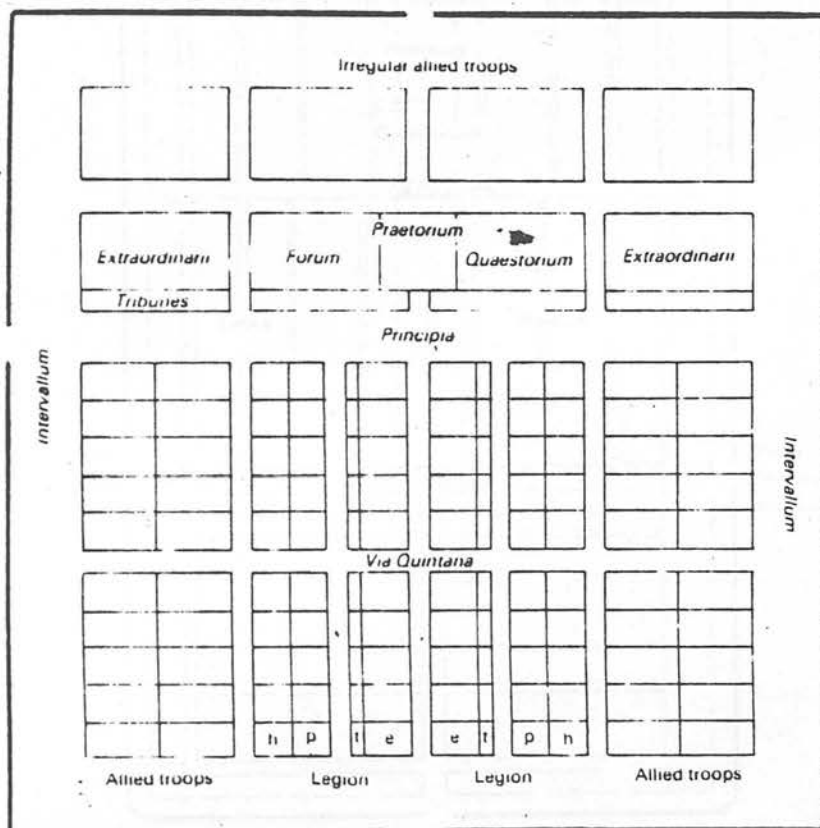
1d. Roman Soldiers in camp.



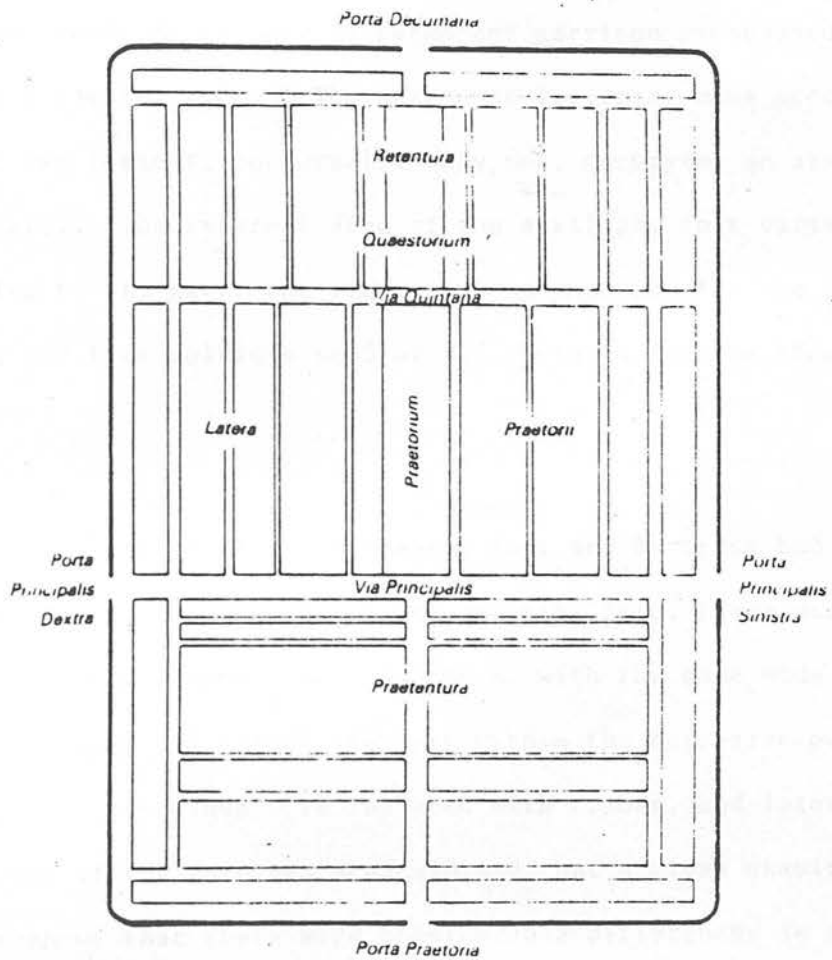
2a. Model of a Roman Tent.



2b. The arrangement of the Century's tents within the Marching Camp.



3. The Polybian Camp- t - triarii  
 p - principes  
 h - hastati



4. The Hyginian Camp.

## PERMANENT BARRACKS -

### Forts and Fortresses

Both Legionary fortresses and auxiliary forts of the Roman Army conformed broadly in their planning to the basic principles of the marching camps described above, with divergences due mainly to the differing needs of an army in permanent garrison as opposed to a temporary camping site. The permanent legionary base accommodated at most two legions, but usually only one, occupying an area of some 20 hectares. The internal area of the auxiliary fort varied in size according to its garrison, from about one hectare for the smallest unit of 500 foot soldiers to 5 or 5.5 hectares for the thousand strong units.

The plan and design of the permanent fort and fortress had developed from the marching camp. As in the marching camp, there was a tripartite division of the internal accommodation, with the same wide streets and a roadway running all around the fort within the defensive perimeter, and the regular tent lines were replaced with timber, and later stone, buildings. The layout of the fort was standardised, but a close examination of fort layouts shows that there were considerable differences in detail between individual fort plans and between the same types of building at different sites. In the layout of fortresses (fig.5) the interior was divided into three parts by two transverse streets, with the front and rear portions further divided by a longitudinal street. The need for increased office space for the administration of the permanent garrison led to the separation of the Commander's office from his residence.

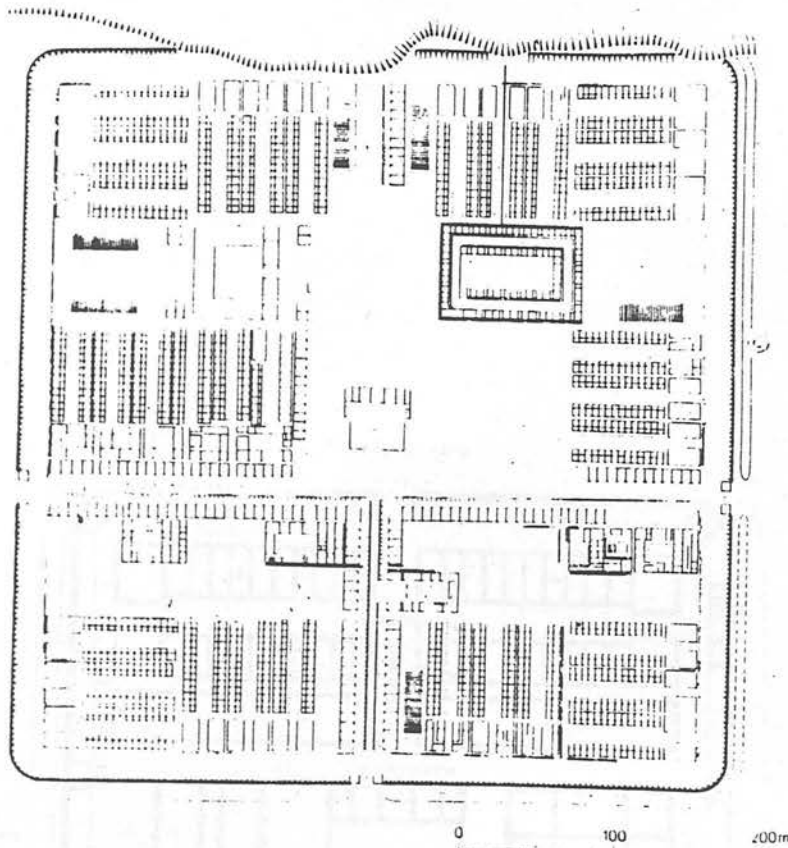


This meant the administrative headquarters, known as the principia, was sited in a central position at the junction of the two principal streets, which was the traditional place for the General's tent in the marching camp. The Commander's residence, which retained the title praetorium, lay either directly behind or next door.

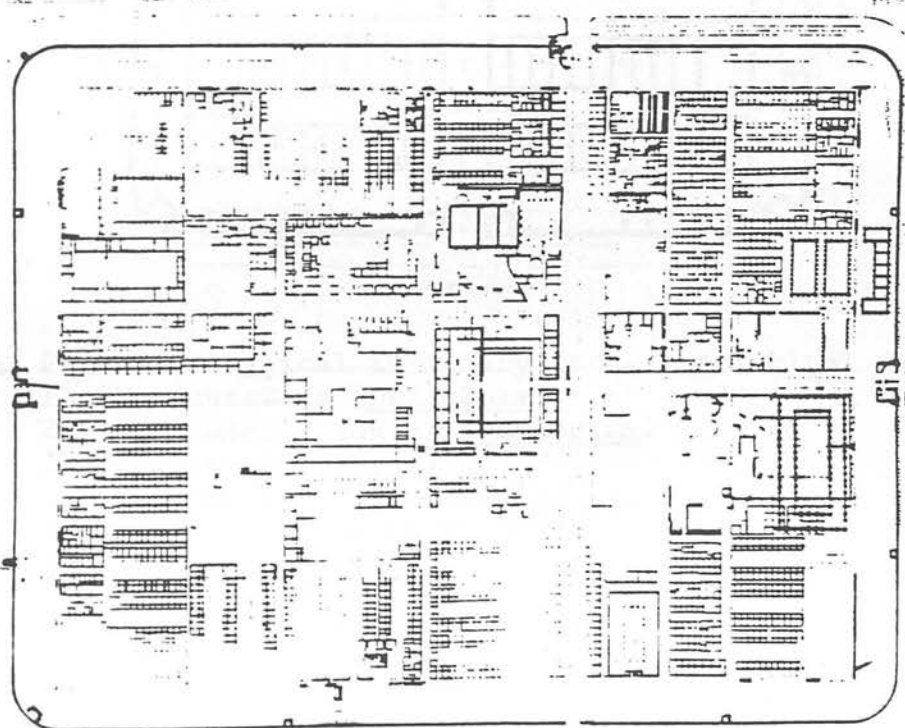
On a permanent site the army had to cope with the logistics of supplying and storing food for the entire garrison often for long periods. Food stores and granaries were needed, which were usually sited near the gates to provide convenient access. ~~O~~ther buildings within the central range included a hospital, workshop and equipment store and, in addition, the barracks quarters of the first Cohort lay on the right-hand side of the principia, with the quarters of the five senior Centurions adjacent to the main street; another Cohort lay on the left-hand side. Facing the main street in the front part of the fortress (the praetentura) lay the quarters of the six military Tribunes and the schola, or meeting place, of the first Cohort. The living quarters of the remaining legionary cohorts occupied the front of the praetentura and the whole of the retentura.

The layout of the auxiliary fort was essentially a miniature of this plan. The main differences are seen in the grouping of the principia, praetorium and granaries together in the central range, with barrack quarters normally confined to the praetentura and retentura. Workshops were present in most forts and the garrison's bathhouse usually sited outside the fort.

In a typical auxiliary fort (Fig 6), the central range is situated between the viae principalis and quintana. At the centre the head-quarter building (principia), flanked by the Commanding Officer's house (praetorium) and the granary (horreum). In the front portion of the fort from the viae principalis to the front gate (praetentura), lie barrack quarters (centuriae), stables and storebuildings aligned either parallel with the main street or at right angles to it. The rear part of the fort from the viae quintana to the rear gates, with quarters, stables and stores aligned either parallel or at right angles.

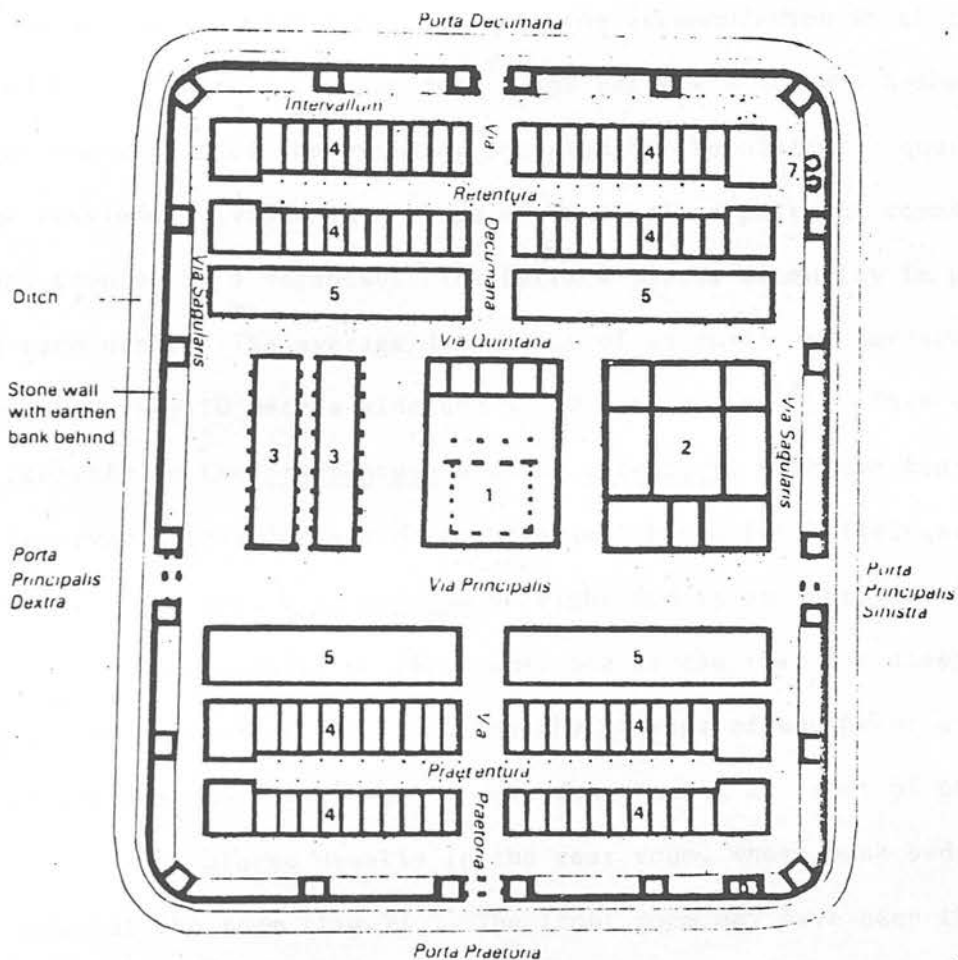


5a. The Legionary Fortress at Inchtuthil, Scotland.



5b. The Legionary Fortress at Menzies, Lower Germany.





6. Plan of a typical Auxiliary Fort. - principal features:

- 1 - headquarters (principia)
- 2 - Commander's house (praetorium)
- 3 - granaries (horrea)
- 4 - Barrack room (centurae)
- 5 - storebuildings or stable
- 6 - latrine
- 7 - rampart avens

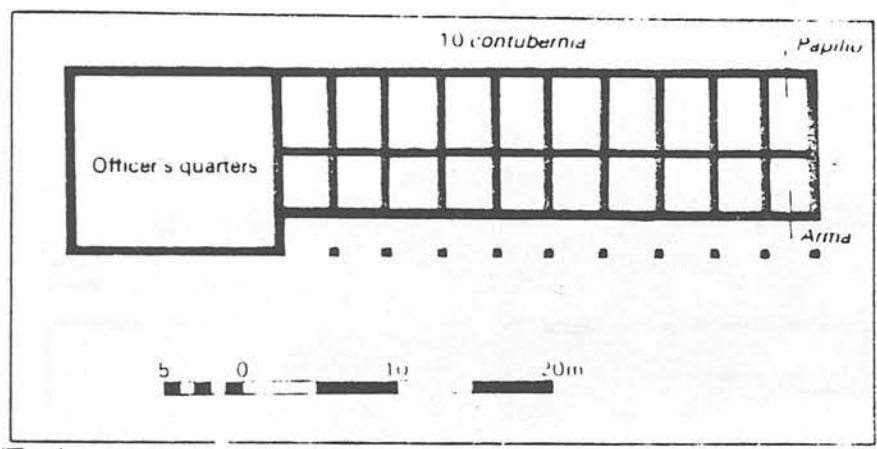
## Barrack Blocks

The Barrack Blocks of both the legionary fortress and the permanent auxiliary fort were laid out in much the same way as the tent rows of the marching camp, although the accommodation which they provided was normally more spacious. The Barrack block was L-shaped with the wider part of the building occupied by the officers' quarters and the remainder divided in a range of equal-sized pairs of rooms for the men, fronted by a verandah. The Barrack Blocks often lay in pairs, facing each other. The average dimensions of an Auxiliary Barrack block are approximately 10 metres wide and 40-50 metres long.<sup>8</sup> They were sited generally in the praetentura and the retentura, with the central range reserved solely for administrative and specialist buildings. Accommodation for each contubernium of eight men in an Auxiliary Barrack quarters consisted usually of two rooms, one at the rear for sleeping (Papilio) and another at the front for the storage of equipment and personal possessions (Ayuma) with a verandah running in front of the building. Hearths are found placed usually in the rear room, where bunk beds occupied three sides of the room (fig.7) The front room may have been the same size as the sleeping room, but was often much smaller. It served as store for the weapons and the wide range of military and personal kit belonging to the eight roommates. Personal possessions would have included clothing and valuables, weapons, tools and cooking utensils. It was here that the soldiers cleaned and polished their arms and armour.

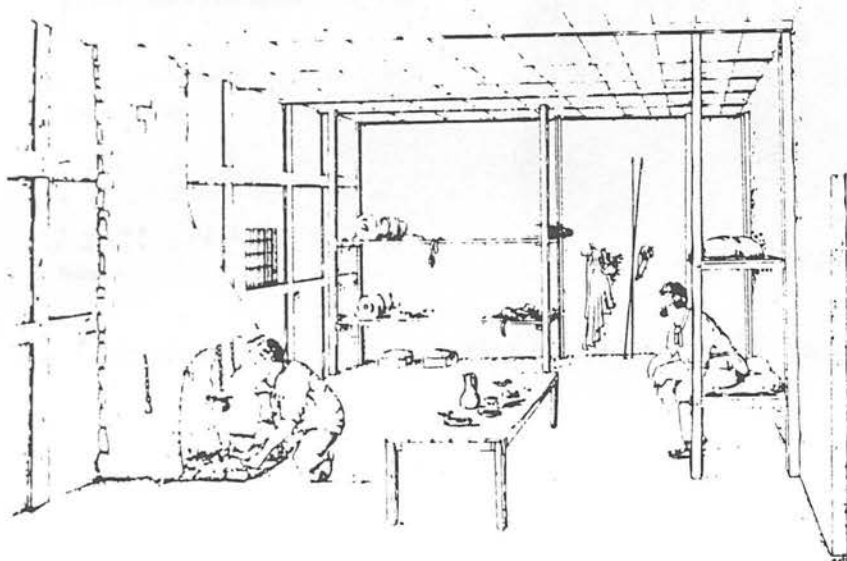
8. Roger Wilson, Roman Forts (London: Bergstrom and Boyle 1980) PP41 - 49.

As time passed the Barrack rooms tended to become more spacious. At Valkenburg <sup>9</sup>, for example, during three periods of rebuilding, the barrack rooms of the Cohorts IIII Thracum quingenaria equitata, were gradually increased in size, probably an improvement in living standards during the life of the fort.

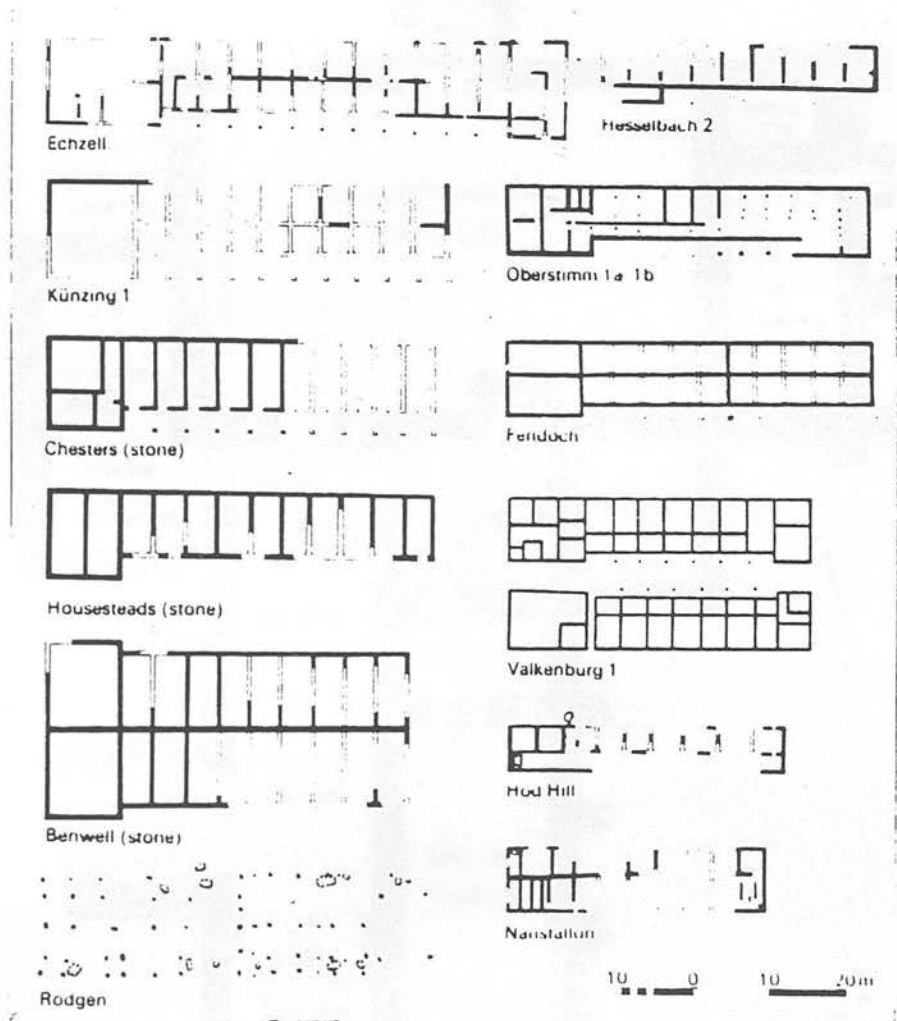
9. Wilson, Roman Forts p. 45.



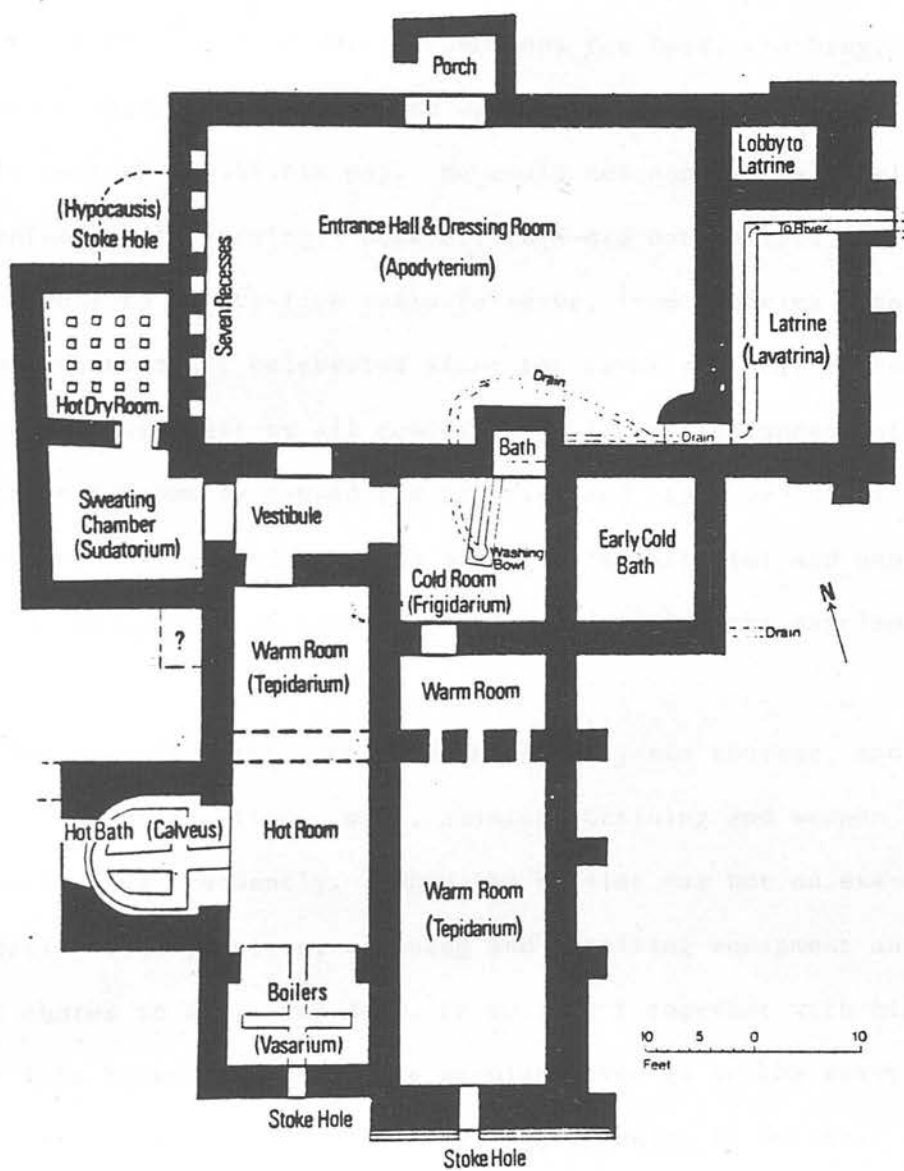
2. A typical Auxiliary Barrack Block.



2b. Reconstruction drawing of the interior of a barrack room (papilio).



8. Comparative plans of Auxiliary Barrack blocks.



9. Bath house at Chester Fort (UK).

### The Roman Soldier

The Roman soldier, on enlistment as a recruit, signed on for twenty to twenty-five years service with an annual pay of about 225 denarii (£18)<sup>10</sup> out of which deductions for food, clothing, equipment and subscriptions to burial fund were made. He was probably left with little more than half his pay. He could not contract a marriage recognised while serving. However, this did not inhibit the soldiers, with twenty to twenty-five years to serve, from entering into unions which were no doubt celebrated after the forms of local custom, and treated as marriages by all concerned. The establishment of a fort or fortress normally caused the creation and rapid growth of settlement around it. Wives and families of soldiers, official and unofficial, swelled the numbers of residents and consumers in the settlement.

Every man's safety depended on his art, his courage, and his bodily vigour. Marching without arms, physical training and weapon training were practised frequently. When the soldier was not on exercises, he had drill, sentry duties, cleaning and repairing equipment and various other chores to do. Off-duty, he could get together with his mates for games like backgammon, gambling or might even go to the nearby town or native settlement and spend the evening drinking in an inn.

The Roman Army is considered as highly successful and disciplined. A combination of factors can be seen to have been responsible for this.

10. G.R.Watson, The Roman Soldier (London: Thames and Hudson, 1969) pp 127.

The Roman soldier held his General in very high esteem. If soldiers despise their General, however pertinent his orders may be, they will be obeyed with reluctance, if not treated with contempt and ridicule. A Roman General had many advantages in this respect, not only from the smallness of their armies, but from the form of their encampments, which afforded constant opportunities of procuring the esteem and affection of the officers and soldiers. The Roman Camps, forts and fortresses, being of a square form and their tents or buildings compactly arranged, their armies, which seldom exceeded thirty thousand men occupied but a moderate extent of ground; so that a General could, with ease, and by way of recreation, visit all the lines or streets of his camp, fort or fortress, frequently in the space of a day, and could pass from his own quarters to any part of the camp in a few minutes. A General, therefore, by being frequently present with the men in overseeing the works, and occasionally mixing with them in conversation, could not fail to ingratiate himself with them and boost their morale; and thus had the best opportunities of supporting his character with his army, independent of the re-presentations of others.

The design and layout of the soldiers quarters was functional and satisfied the accommodation needs of the soldiers. The storage space was distinct from the sleeping area and though the internal space allocation was small, this was increased in subsequent buildings. The common facilities were located centrally in most forts, between the retentura and praetentura, and were at a convenient distance from all the living quarters situated in both the retentura and praetentura.



The whole arrangement facilitated a high frequency of interaction among the soldiers both on and off-duty.

However, it must not be forgotten that the character of a legionary soldier was attended with a considerable degree of dignity. No slave was admitted into the ranks; and, in a state which abounded with a multiplicity of slaves, a citizen set a high value on his liberty. Hence every soldier acted from the best principle; since by defending his own liberty, which he rated so high he necessarily defended that of his country. A battle frequently determined the fate of the nation. The subversion of a government and slavery of the citizens, or at least of their army was no uncommon consequence of a single defeat. A soldier, therefore, in those times, fought not only for his life, but to save his country, friends or family from perdition.

## THE CASTLE AND FORTIFICATION ERA (MEDIEVAL)

After the fall of the Roman Empire in 378 AD, the whole pattern of warfare changed. Consequently, a new system of defence was evolved. Professional soldiers were no more, armies were raised as the need arose and disbanded soon after campaigns. The need, therefore, for an elaborate Barrack accommodation for the troops did not arise for a long time. The Medieval world perfected a type of defence which was normally resistant to direct attack. Height and thickness of walls were vital for a small garrison to hold off a large invading force. Thus erection of Castles became the order of the day during this era. But already, by the end of the fourteenth century, the impact of gunpowder was having its effect on the theory of warfare. This led to the development of various forms of fortification, which culminated in the introduction of the Bastion fortification in the sixteenth century. Further developments in weaponry and tactics made this form of defence superfluous - the introduction of firearms not only increased firepower on the battlefield, but it destroyed the immunity of fortresses.

Independently of the introduction of firearms, another and at the time equally important change took place: the replacement of massed heavy cavalry as the decisive element on the battlefield by massed heavy infantry. The effort to find a tactical organisation on which fire power and infantry shock tactics could be combined led to major innovations at the beginning of the seventeenth century. Drill and exercise for the infantry became the basis of tactics. Precision in movement demanded marching in step. The group sub-ordination of men demanded better discipline and a more closely coherent whole.

But even before the end of the sixteenth century, the disbandment of armies at the end of a campaign and their re-raising at the start of the next, hitherto a general practice, was seen to be an inefficient and costly way of furnishing the state with soldiers. Regular standing armies, before long, became the rule and so did their accommodation.

From the time of Conde's victory over the Spanish Army at Rocric in 1643, the French army led the fashion in European standing armies for a century. Very noticeable was the rise in numbers.<sup>11</sup> King Henry VI of France, at the beginning of the seventeenth century had an army of some 15,000, of whom 3,000 were Swiss. The thirty years war which lasted from 1618 to 1648, resulted in a large increase in the size of the army. The French army of 1628 numbered some 280,000 men. There were 440,000 men on the strength in 1690, in a population of little more than 20 million. After each peace, members naturally declined. It had become common in the mid-seventeenth century to keep 160-200,000 men under arms even in peace.<sup>12</sup>

11. Conde the Great, in full, Louis II De Bourbon, Prince De Conde, one of King Louis XIV's greatest Generals. J.U. Nef, War and Human Progress (London: Routledge and Keegan Paul, 1950) p.202

12. Stanislaw Andrzejewski, Military Organisation and Society (London: Routledge and Keegan Paul, 1954) p.127.

## THE BRITISH ARMY

Oliver Cromwell formed the first English standing army in 1645 during the English Civil War.<sup>13</sup> This New Model army of about 80,000 men was later disbanded by Charles II in 1660 except for a Household Brigade (Coldstream Regiment of Foot Guards) which has survived to this day, the only regiment of the Army that can trace an unbroken descent from it. The strength of the army later increased to 20,000 during the reign of James II. The revolution of 1688, however, precluded establishment of a military monarchy, and the English Bill of Rights (1689) gave parliament the control of the army that it maintains today.

During the eighteenth and nineteenth centuries, as Britain consolidated its Colonial empire, it established standing forces in the Colonies, thereby increasing the size of its army. The territorial force<sup>14</sup> and special reserve were established between 1905 and 1912. Conscription during World War 1 greatly increased the size of the army but it was reduced to a minimum with an end to conscription after 1919. In July 1939, however, conscription was again enforced.

Major changes in the British army occurred after 1945. Troops stationed overseas were returned home as the British Colonies gained independence, and the military forces were placed in Europe or absorbed into home guards. Conscription was ended in 1960 and an all volunteer army created. With the introduction of nuclear weapons,

13. Frederick Myatt, The British Infantry (Dorset:Blanford Press, 1983) p.23

14. Known as the Territorial Army after 1921.

the size of the territorial army was greatly reduced. In 1964 the Ministry of Defence was established to administer all the armed forces and in 1972 all army forces were placed under Headquarters United Kingdom Land Forces. The Secretary of State for Defence is responsible to the Prime Minister and the Cabinet. He is advised by the Chief of Defence Staff, who is aided by the three Service Chiefs. The army is charged with the responsibility of National defence and the fulfilment of international mutual defence commitments.

Housing of Soldiers Before 1945

Debates in Parliament at the time demonstrate the fears of a recurrence of any kind of military dictatorship, with the consequence that both officers and enlisted men were regarded with ill favour, were under-paid and badly housed, a condition which despite the succession of efforts by such notable Commanders as Raglan, Wolseley, Roberts and Kitchener, continued until the outbreak of the war....

Hutchinson 15

This indicates the conditions of the British soldiers before the outbreak of World War II. Up to the end of the first half of the nineteenth century, the housing of the British soldier was deplorably neglected and enquiries instituted just before and just after the Crimean War by several Parliamentary Committees and Commissions, both in Britain and overseas in the Colonies, tended to show that the high mortality in the army was due in a great measure to the diseases caused by overcrowding of men in more or less unsanitary barrack rooms. In 1838, regulations that barrack rooms were not to be overcrowded was enacted, but this was not put into effect until the publication of Engineer Regulations of 1851 when a definite cubic space per man was fixed. The nominal rates per individual soldier then laid down ranged from 450 cubic feet for barracks in Britain to 900 cubic feet for hospitals in the Colonies.

In 1855, the first important investigation into the living conditions of the soldiers was carried out by Lord Monck's committee. The evidence collected point to the necessity for better accommodation for the comfort and convenience of soldiers, and for the creation of a higher tone of social habits amongst them.

15. Lt-Col. G. S. Hutchinson, The British Army (London: Gramo publications, 1945) p.10.

While the chief recommendations of Lord Monck's and other subsequent committees were confined to remedying the overcrowding of single men and the improper housing of married soldiers, by the laying down of reasonable (at the time) cubic space and superficial areas for each individual, and in arranging for the construction of separate married quarters, the Committees also suggested the introduction of certain amenities e.g., canteens, ablution rooms with foot-baths, wash houses for the use of soldiers' wives, workshops, urinals with divisions, lighting by gas and cubicle partitions.

In 1857 a Royal Commission was constituted under the Right Honourable Sidney Herbert to make further enquiries on the soldiers' living conditions, and from their report,<sup>16</sup> presented to Parliament in 1858, the death rate among soldiers in peace time was discovered to be approximately twice as high as among civil town and country populations of the same ages; Based on the scale of cubic space per man recommended by this Committee, all barrack rooms in Britain were found to fall short of the necessary accommodation for the troops by about one-third. There were worse cases.

Another board, The Barrack and Hospital Improvement Commission was later constituted to consider the recommendations of the Royal Commission in detail. Their final report, which was presented to Parliament in 1861,<sup>17</sup> besides dealing with the sanitary conditions of each establishment, and the works and improvements considered necessary in every case, also laid down certain hygienic principles governing

16. Royal Commission Report on the Sanitary State of the Army (1858) in Royal Engineer Corps Library, Chatham.

17. Barrack and Hospital Improvement Commission Report (1861) in Royal Engineer Corps Library, Chatham.

the proper construction of barracks, hospitals and their accessories. In 1862 the Committee was constituted a Standing Committee which continued to do the same work but changed its title to Army Sanitary Committee in 1865. In its report dated April 1866, it found that the character of the accommodation provided for soldiers and their families was a direct cause of the disastrous epidemic of scarlet fever in Aldershot in 1864/65. These conditions lowered the morale in the men. In conclusion to that report, it stated that "... little will be gained in improving the general health of families until children are removed from men's barrack rooms, and all families are provided with dwellings, and other domestic requirements in conformity with the obvious requirements of health." <sup>18</sup>

18. Army Sanitary Committee Report (1865)  
in Royal Engineer Corps Library, Chatham.



## Unmarried Soldiers' Housing

A typical infantry regiment during the restoration period (1661) had at its head a Colonel, often a member of the Royal family or a distinguished general or nobleman. He might not have much to do with the day-to-day running of the regiment or even its command in action. This was left to the Lieutenant-Colonel, who had a Major as second-in-command, an adjutant, a chaplain, a surgeon and mate, a quartermaster and a marshal. In the regiment, there were between eight and twelve companies each consisting of a Captain, two sub-alterns, an Ensign, two Sergeants, three Corporals, two drummers and 100 Privates. During this period, there were no Barracks in England, the usual custom was to billet soldiers in inns. As the inn-keepers disliked this system, which was unprofitable, they took care to do things as cheaply as possible; crammed their unwelcomed guests into attics, leaking outhouses or barns, and fed them as badly as they dared. This situation had adverse effects on their discipline, training and administration. There was a high rate of desertion.

It is therefore not too surprising when it is discovered that, when Barracks were started, soldiers were cramped together in their Barrack rooms. Like in Gibraltar (fig.10), long lines of beds nearly touching one another were arranged on either side of a vault of a great length, lighted and ventilated practically from one end only. In Guernsey, the beds covered almost the entire floor space (fig.11). In the same category were the Barrack rooms in Brompton Barracks (Chatham) and in almost all the seventeenth and eighteenth century Barrack rooms.

U.K. Barracks before the end of the nineteenth century were characterised by a variety of layouts. The principal examples of which include:

building erected round closed courts; Barrack blocks placed closed to the perimeter walls; latrine, urinals, wash houses etc. placed between the Barrack blocks and perimeter walls; buildings in which men were concentrated in one or two large blocks. Examples of these are typified in Hyde Park Cavalry barracks, Wellington barracks, Royal Barracks Dublin, Clarence Barracks in Portsmouth, Castle and Shamble Barracks in Galway, Linen-hall Barracks in Dublin and Hulme Cavalry Barracks to mention a few.

The design of the Barrack room blocks themselves were characterised by Barrack rooms placed in pairs, with windows only on one side; barrack rooms over stables; barrack rooms with access only by long internal corridors or by corridors covering one side of the room; in some of these, accommodation for non-commissioned officers (NCO's) was carved out of the men's rooms by wooden partitions and using basements for barrack rooms. Illustrations of Barrack Rooms placed in pairs could be seen at Woolwich, at the Wellington Barracks, at the Cambridge Barracks, Portsmouth, and in numerous other Infantry Barracks of this period. An example of this arrangement in a block of Wellington Barracks is given in fig.13. In this case, rooms were constructed for 14, 15 and 16 men each. The Barrack rooms over stables with long, dark, unventilated corridor or passage along the whole lengths of the block, giving access to the rooms right and left of it, were exemplified in most Cavalry Barracks. The rooms have, consequently, windows only on one side. The plan of the east wing of a Barrack room floor at Hounslow barrack (fig.14) shows the access to the men's rooms provided by means of a corridor 320 ft. (97.5m) in length, with the rooms opening right and left of, and having windows on one side only.

The barrack quarters in Edinburgh Castle (fig.15) is also an example of such arrangements though occupied by an infantry unit. Fig.16 shows another block in Wellington Barrack with corridor covering one side of the range of rooms. In many Barracks of this period, no sufficient accommodation was provided for non-commissioned officers, generally a wooden partition is placed in one corner of each Barrack room. Fig.17 shows how these partitions are generally placed in the rooms. There were a number of Barracks in which no proper staircases were provided, and means of access to the upper rooms were made by boxing off a staircase from a part of two adjoining Barrack rooms on each floor. Example of this arrangement occurred at Maidstone, Paisley, Stockport, Western Height barracks at Dover, Canterbury, Salford and Brighton. An illustration of this as it existed in Brighton Infantry Barrack is shown in fig. 18. Later plans of Barrack blocks during this (19th) century had roomy stone stairs extending the whole height of the building. They were two or three stories high with two rooms on each floor, four or six rooms in all and a sergeant's room opening out of the landing on each floor. The barrack blocks at Templemore barracks were an example of this arrangement (fig.19). It shows the staircase, separate sergeant's room and two soldiers' rooms 6.1m wide, with windows on opposite sides. The rooms accommodated 15 men each. Another adaption of the same principle also existed at Beggar's Bush barrack in Dublin. The rooms were, however, 9.8 m wide and 6.7 m in length. (fig.20).

Barrack huts became an important part of barrack accommodation in the later part of the nineteenth century. There were wooden huts with single walls, wooden huts with double walls, corrugated iron huts and brick huts. Wooden huts used as Barrack rooms varied in dimensions.

Those at Colechester were 11.6 metres long, 6 m wide, and, including the slope of the roof, they averaged 3m in height. Each hut accommodated 24 men, at  $2.9\text{m}^2$  per man. These huts were arranged side by side, in a similar manner to those in Chichester barracks (fig.46). Similar huts were also at Aldershot, Woolwich and Shorncliffe. In Shorncliffe, they each accommodated 25 men. There were generally three or four windows on each long sides of all huts.

Also at the close of the nineteenth century, at the same time the barrack huts were in use, a permanent type such as that in the Stanhope line, Aldershot was adopted. These Barrack blocks were two-storied and built as shown in fig.21. A detailed plan of the block is shown in fig.22. It accommodated a sergeant and fifty-four men on each floor, and had only one entrance and staircase. The conveniences were provided in separate buildings. In this type of Barrack block, the soldier slept and ate in the same room. The food must in any case inevitably have been cold by the time they reached the barrack rooms, for the cook house was some distance away.

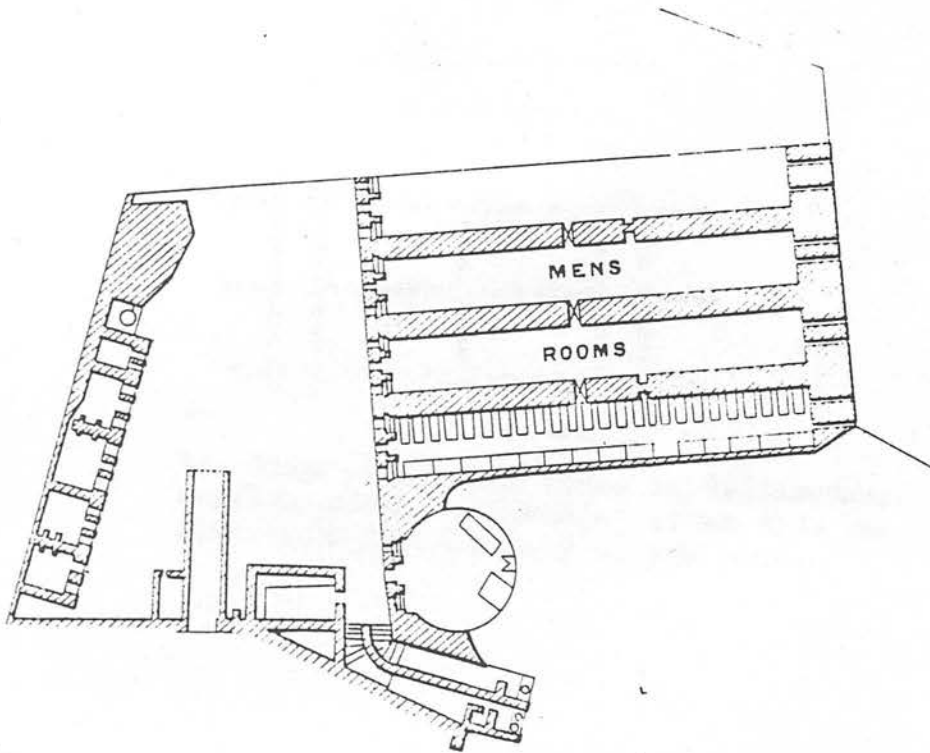
Next in order after these, in early twentieth century, came the Company block type illustrated in fig. 23. This was a double storey block which consisted on each floor two 24-man rooms joined in the centre by two ablution rooms, one non-commissioned officer's room, a company store, and a central stair case. The number 24 must have been a convenient division for administrative purposes, representing a section. Another design of this period was the "half-battalion" type shown in fig.24. It consisted of two double-storeyed blocks, each held two companies, facing inwards towards dining rooms and cookhouses built between them, and linked with them and with each other by means of verandahs and covered walkways.

The double company blocks were arranged in 12 man rooms, with passages between, leading from the verandah on the inside to ablution rooms on the outside. the non-commissioned officers' room, the company stores and staircase were located on the inner side of the verandah, opposite the centre of each company. The dining hall was divided into two company diningrooms by a moveable screen wall. The wash-up rooms (one per company) are adjacent to each dining room and linked with the cookhouse by a short covered walkway. Bathroom and drying rooms were provided on either side of the cookhouse for the men.

Fig.25 shows a typical site plan for an Infantry Brigade at the start of the twentieth century. Here it will be seen that the four battalions were separated from one another by cross roads and are themselves girded by longitudinal roads into three main portions - officers' buildings; unmarried soldiers' Barrack blocks and parade; and married soldiers' quarters, a strip being reserved for brigade accessories between the central battalions. The particular form of soldiers' Barrack blocks shown in these plans was the latest type - the half battalion verandah type. Two Barracks built at the start of this century, Sobraon and Gujerat in Colchester were examples of Barrack block plans, adapted from the type just described to suit particular sites (fig.26). These show two stages in the design of Barrack blocks - the single company block type in Sobraon Barracks and the half-battalion verandah type in Gujerat Barrack. The Gough and Keane Barracks at the Curragh (fig.27) built during the same period, is another example apart from the narrow parade ground necessitated by the site.



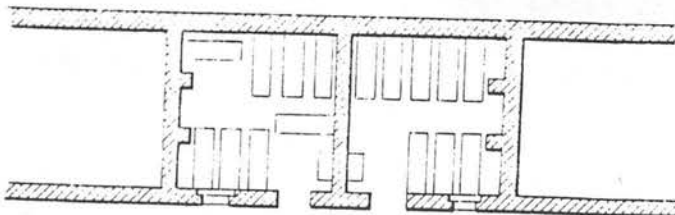
ORANGE BASTION CASEMATES.  
GIBRALTAR.



10. Plan of Orange Bastion Casemates showing the overcrowding in Barrack rooms.

TWO ROOMS IN CITADEL, FORT GEORGE, GUERNSEY.

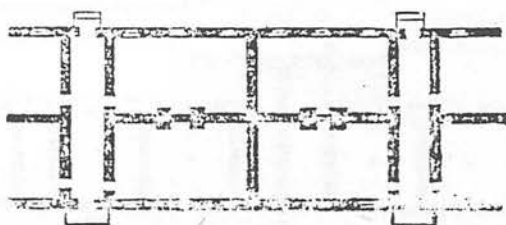
*Showing Beds folded down.*



11. Plan of Barrack rooms in Citadel, Fort George showing bed positions.

-WELLINGTON BARRACKS.

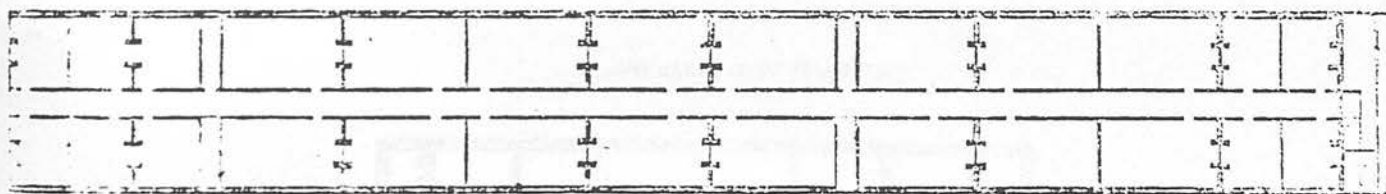
PART OF A. BLOCK.



13. Plan of Barrack rooms in Wellington Barrack showing soldiers' rooms side to side with windows only on one side.

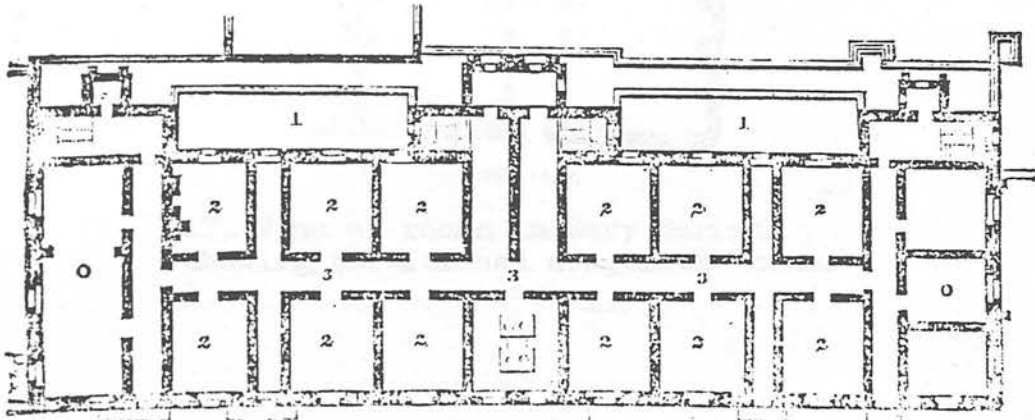
-HOUNSLOW BARRACKS.

PLAN OF EAST WING.



14. Plan of Barrack rooms in Hounslow Barrack showing the access to the soldiers' rooms provided by a means of a long, dark, unventilated inner corridor 97.5m in length, and having windows only on one side.

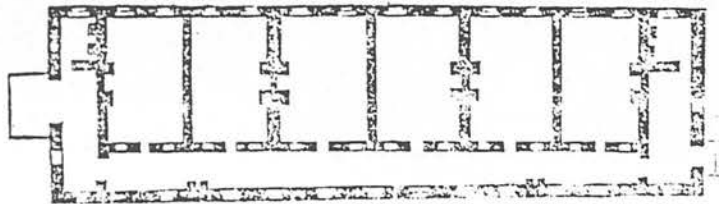
—NEW BARRACK, EDINBURGH CASTLE.



15. Plan of Edinburgh Castle New Barrack.

- 1 - deep sunk areas from which part of the lower barrack rooms derive their light and ventilation.
- 2 - soldiers' rooms having windows only on one side.
- 3 - dark, unventilated inside corridors.
- 0 - Officers' quarters and Mess.

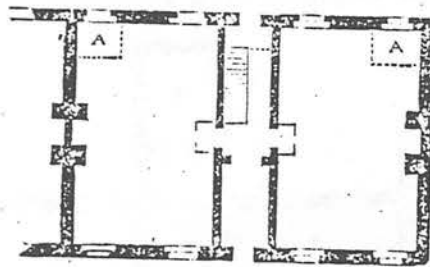
—WELLINGTON BARRACKS.



PLAN OF B. BLOCK.

16. Plan of another Barrack room block in Wellington Barrack showing a corridor covering one side of the range of rooms, which have consequently windows only at one end.

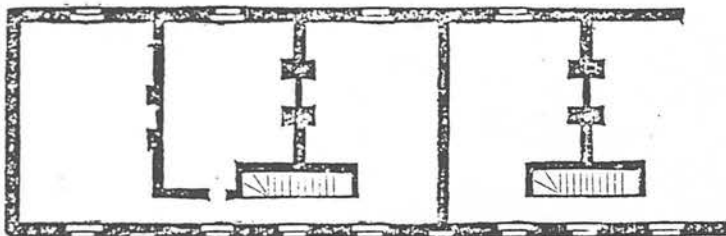
—ROOMS WITH SERJEANTS'-BUNKS IN BURY  
BARRACKS.



GROUND PLAN.

17. Plan of rooms in Bury Barrack showing partitioned sergeants' room.

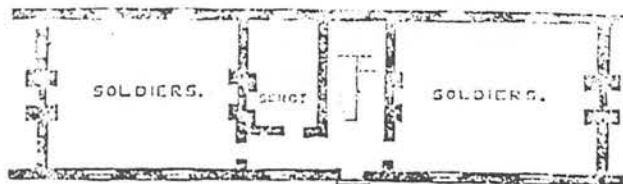
—INFANTRY BARRACKS, BRIGHTON.



UPPER FLOOR.

18. Plan of Barrack room block in Brighton Barrack showing the staircase boxed off the soldiers' rooms.

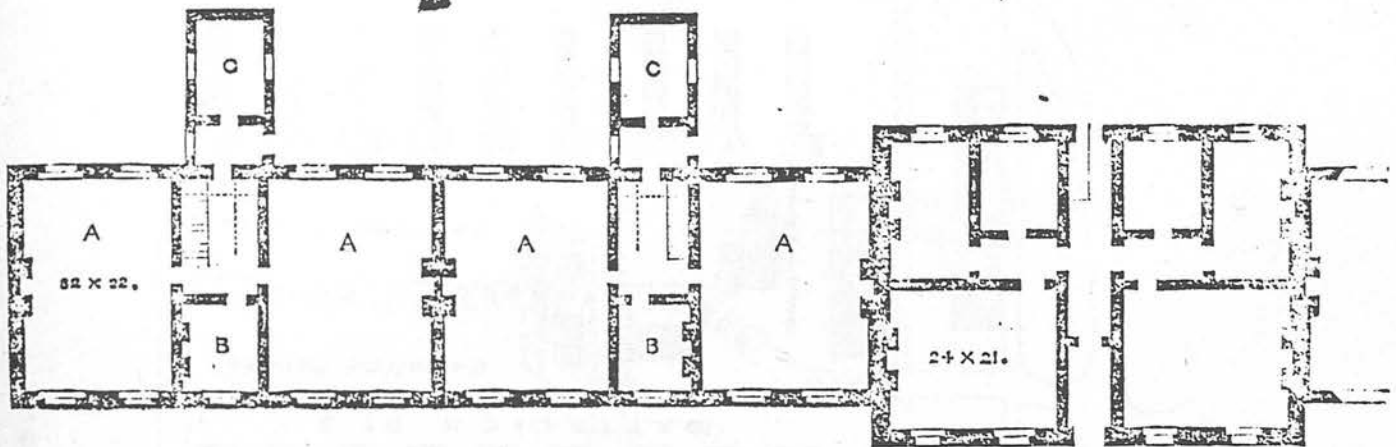
—PLAN OF SOLDIERS' QUARTERS, TEMPLEMORE.



GROUND PLAN.

19. Ground floor plan of Barrack room block in Templemore Barrack. Notice the location of the sergeants' room.

—BEGGARS BUSH BARRACKS, DUBLIN.



GROUND FLOOR.

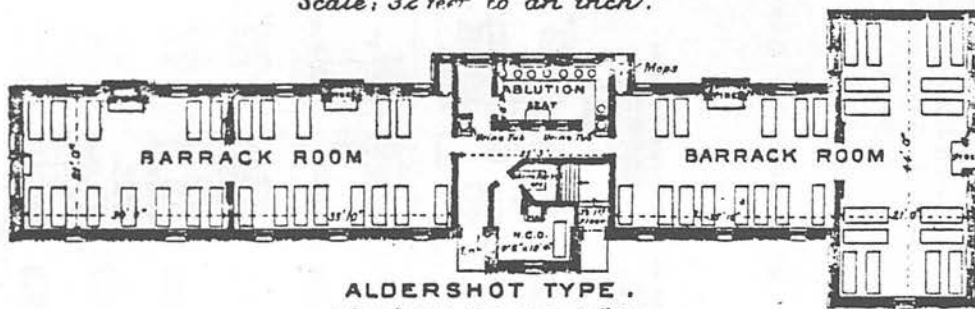
A Men's rooms.

B Serjeants' rooms.

C Ablution rooms.

20. Plan of Barrack block in Beggars Bush Barrack, Dublin.

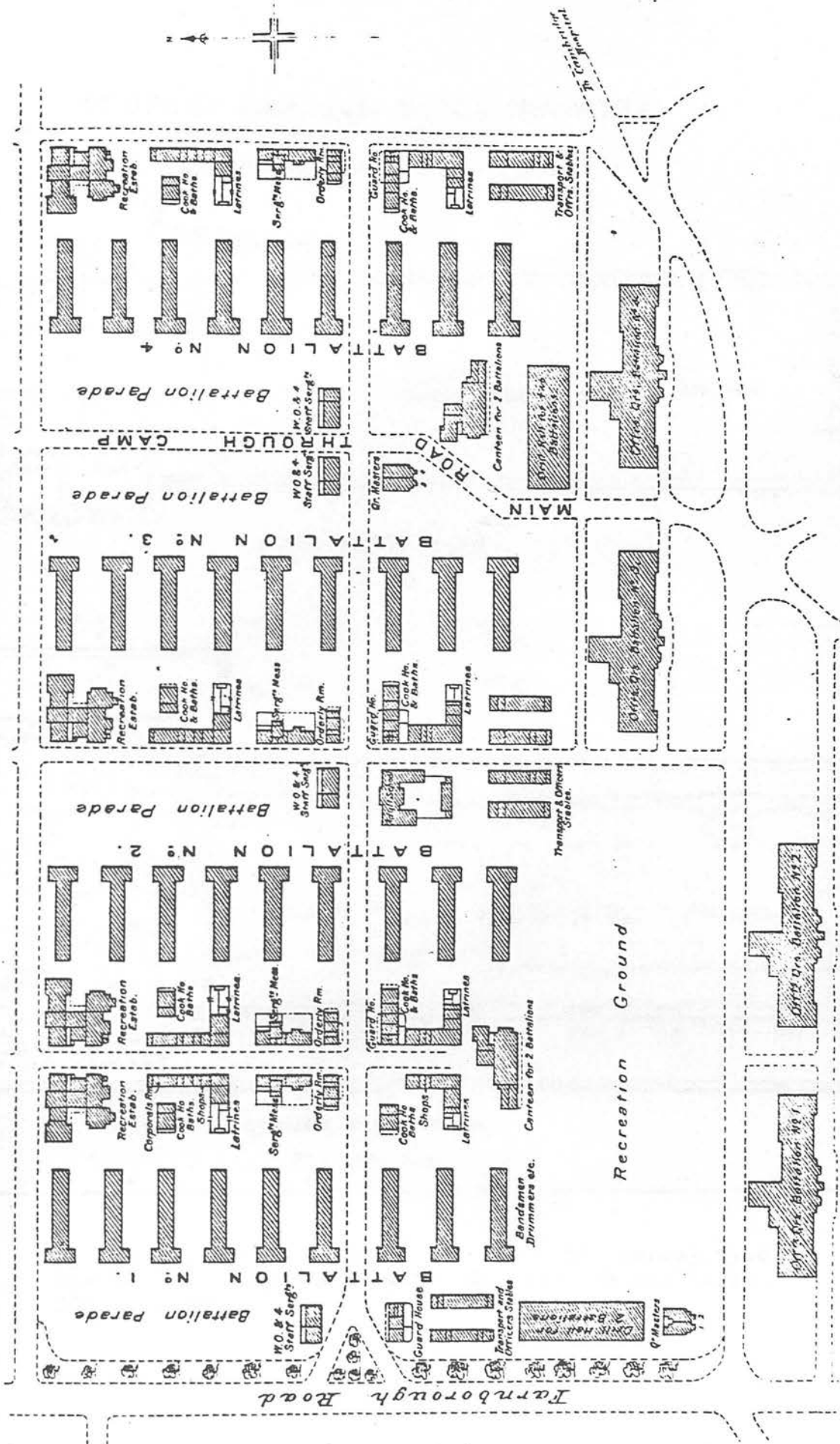
Scale: 32 feet to an inch.



ALDERSHOT TYPE.  
1 Sergt & 34 Men on each floor.

21. Plan of the T-shaped Barrack blocks at Stanhope lines, Aldershot (see 22).

SITE PLAN OF STANHOPE LINES.





### GROUND & FIRST FLOOR PLANS.

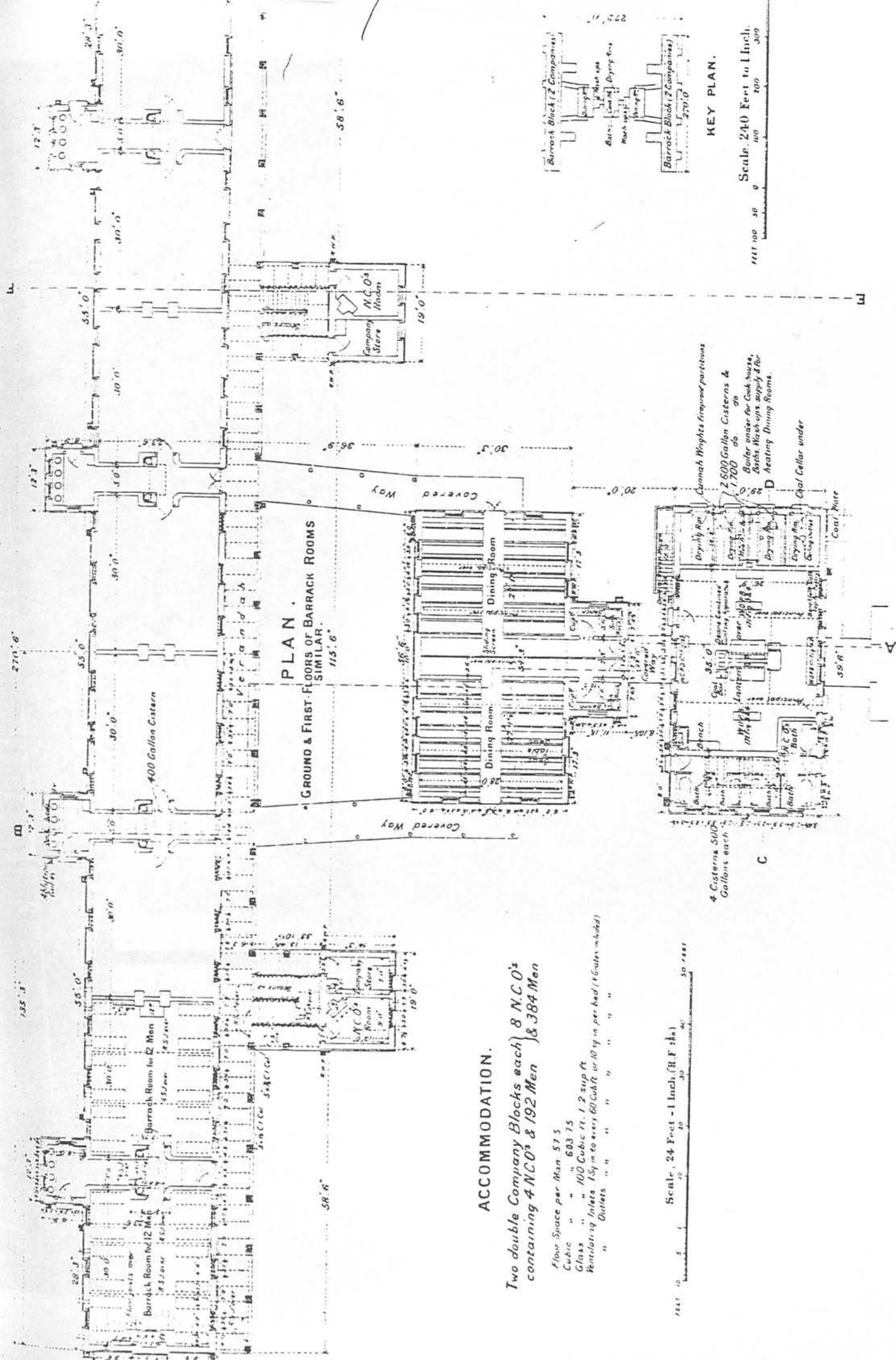


Scale, 1 in. = 16 ft.



23. Ground and first floor plans of the Company type Barrack block in the UK late 19th century and early 20th century.

**With Cook House, Baths, Drying Rooms, Dining and Wash-up Rooms.**



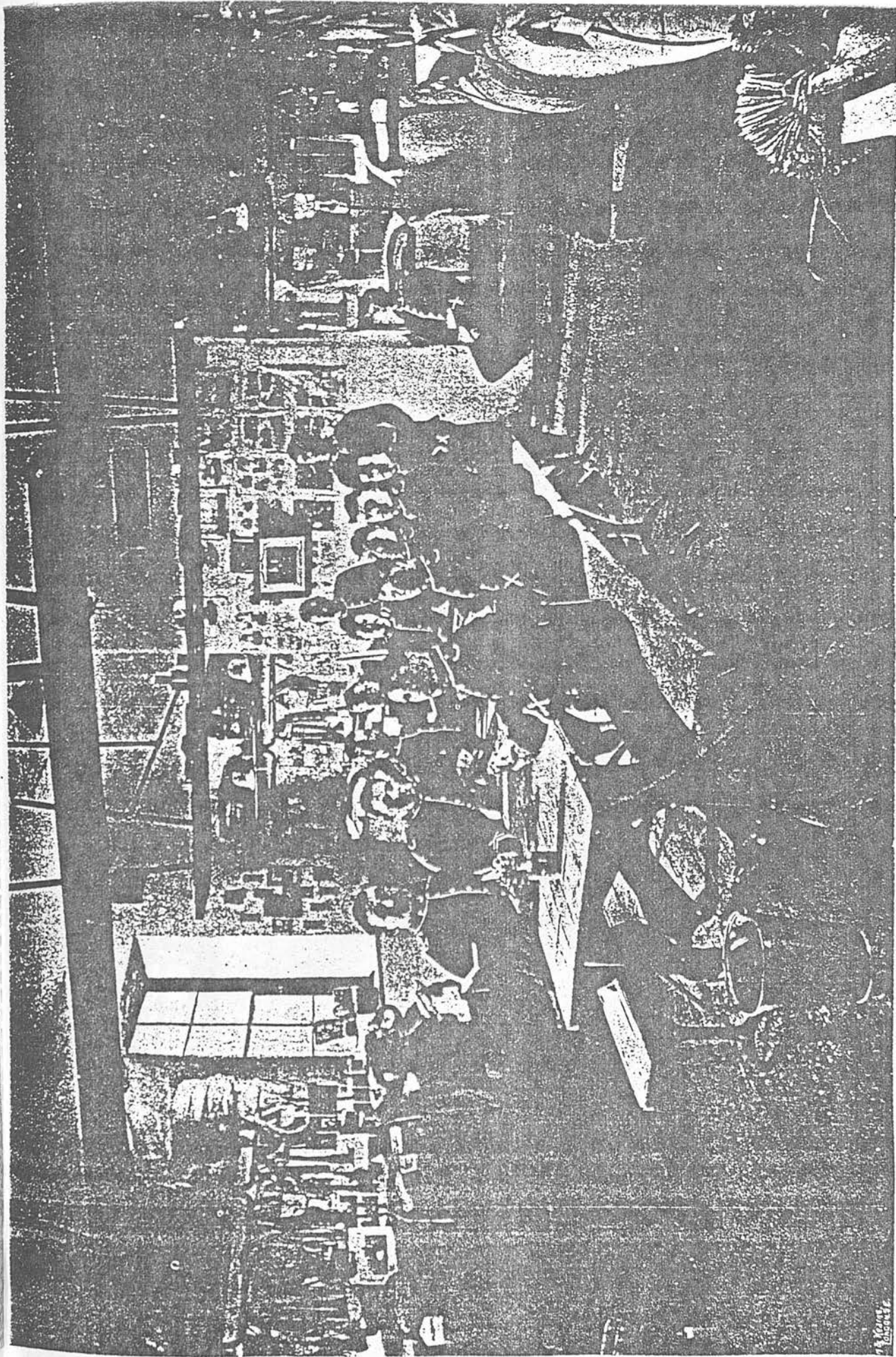
## ACCOMMODATION.

Two double Company Blocks each } 8 N.C.O.'s  
containing 4 N.C.O.'s & 192 Men } 8384 Men

Flour Space per Man 57.5  
Cubic " " 603.75  
Glass " " 100 Cubic ft. 12 sup ft  
Ventilating Inlets 1 sq in to every 60 Cub ft or 10 sq in per bed (8 Gates included)

Scale, 24 Feet - 1 Inch (R.F. 1/24)

24a. Half battalion Barrack Block (verandah type)

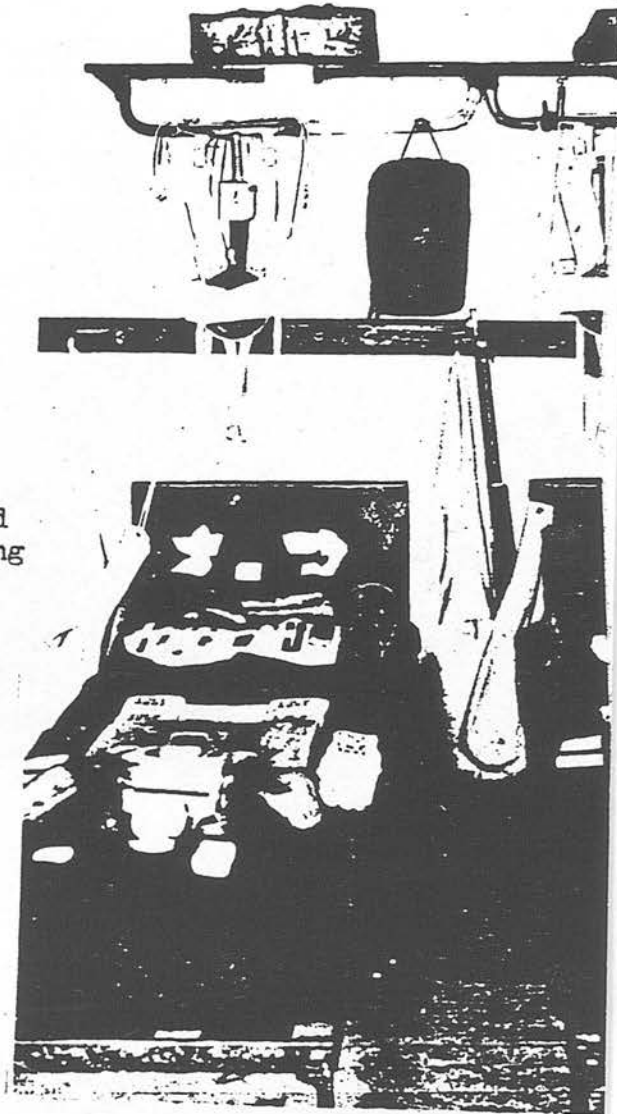


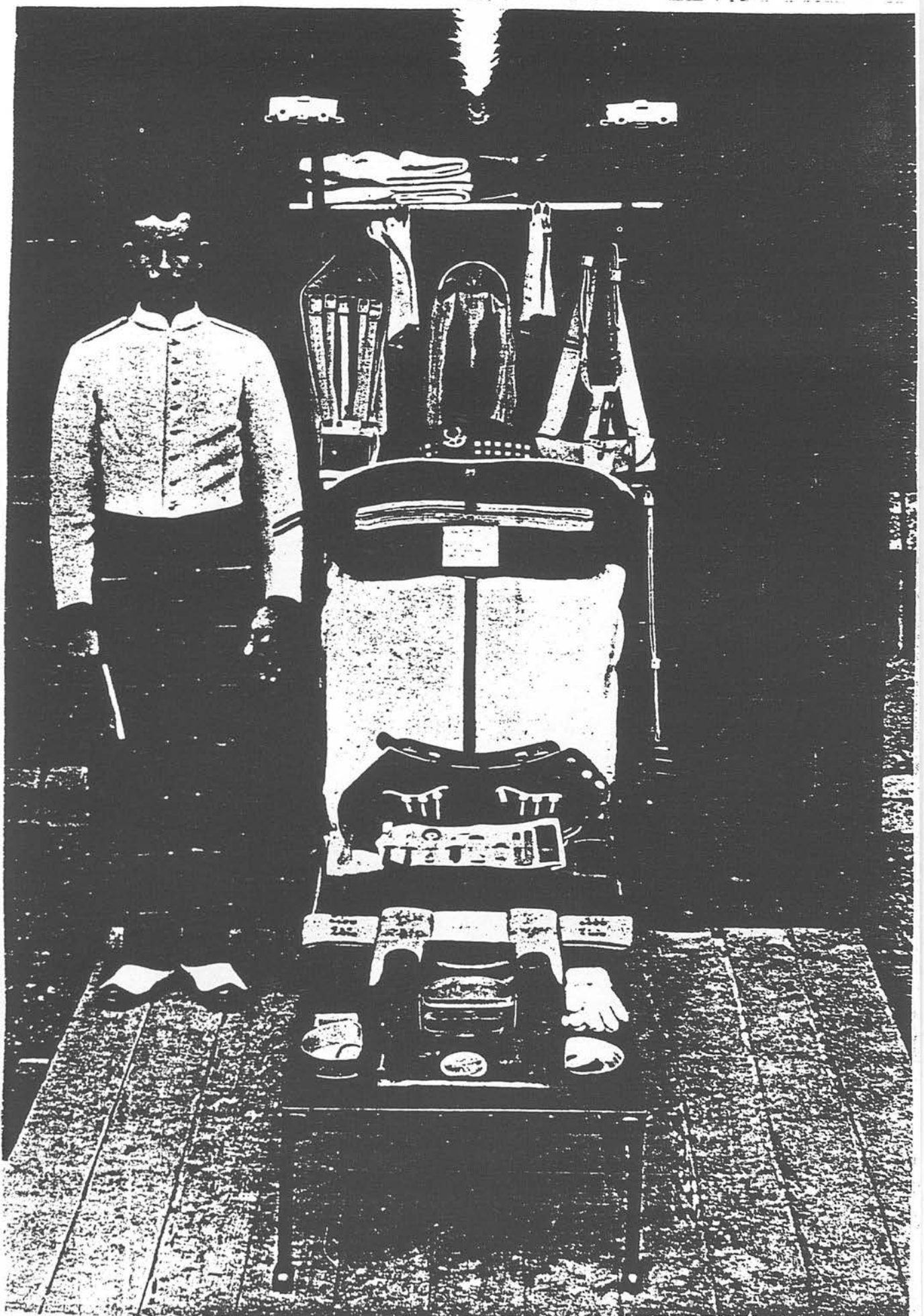
24b. A Company Barrack Room. Here we see the private soldier at home, and obtain a glimpse of barrack-room life by day among the men off duty. Round the room are ranged the men's beds, bedding and clothes, all neatly and uniformly packed away. On the wall at the head of each bed are placed each man's arms and belts ready at hand at any moment. The men are allowed to decorate the walls of the apartment, each within his allotted space, as they like, with photographs or pictures and the effect adds greatly to the comfort and appearance of the room. All mess together at the central table.



Barrack room (1900) in the U.K., notice how close the beds are.

24d. Below A Regimental Cook house, U.K. (1900)  
Here we see the interior of the regimental cook house where all the meals of the men not married nor members of the sergeant's mess, are prepared. Each of the four companies of the regiment selects two men as cooks, who are relieved of all regimental duties except the annual musketry course. As a special inducement to the satisfactory performance of the kitchen work a monthly money price is given to the cook who prepared the best dinners in regard to cooking, serving and making the most of the materials.





24e-A Soldier's kit

(1900)

# TYPICAL SITE PLANS FOR A BRIGADE OF INFANTRY. HOME STATIONS

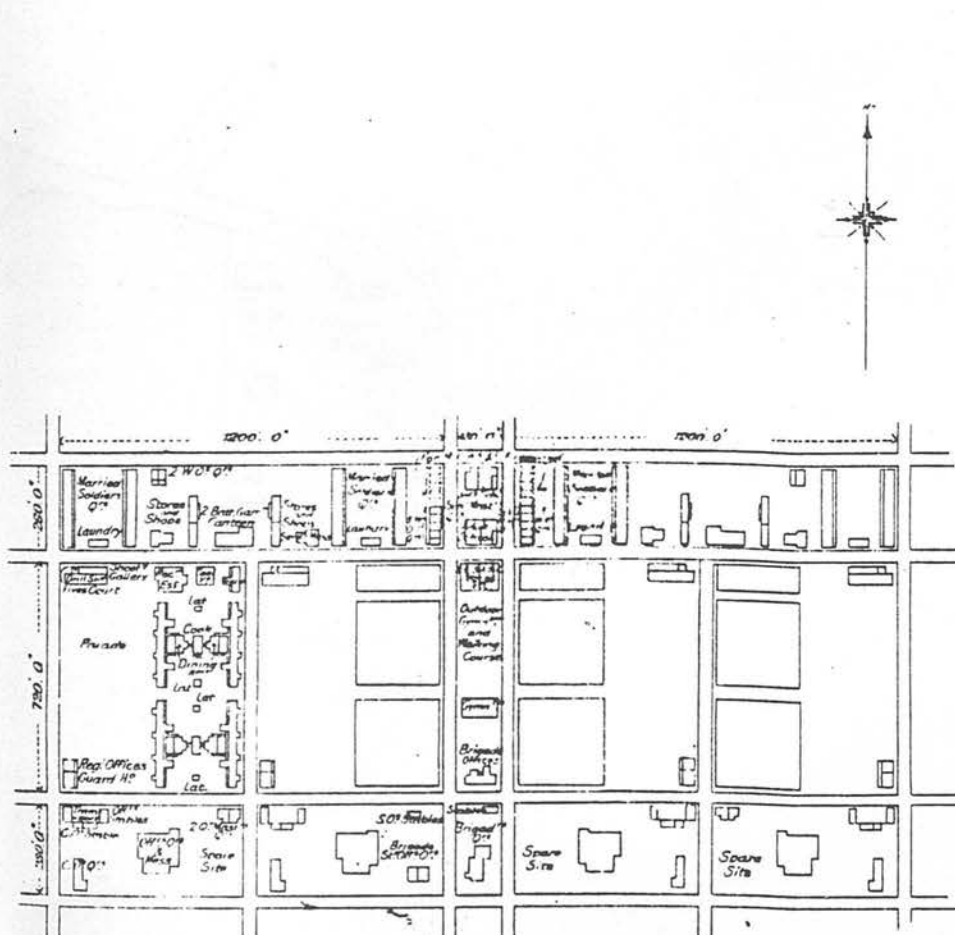


Fig. 1.  
Long side of Site running E. & W.  
Length 2630 ft.  
Breadth 1340 ft.  
Area 80° 3' 24" P.

Scale 76.032 Inches to a Mile. R.F. 1350

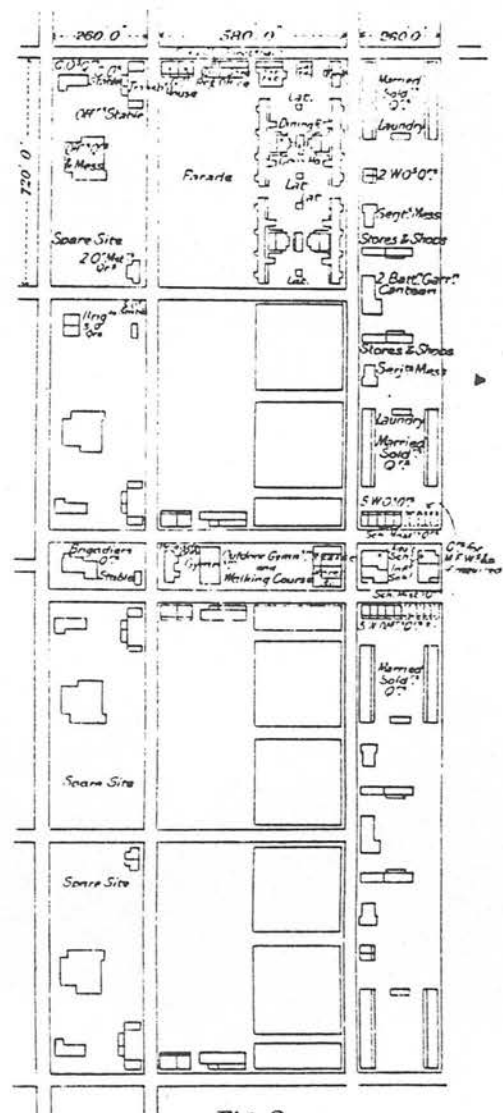
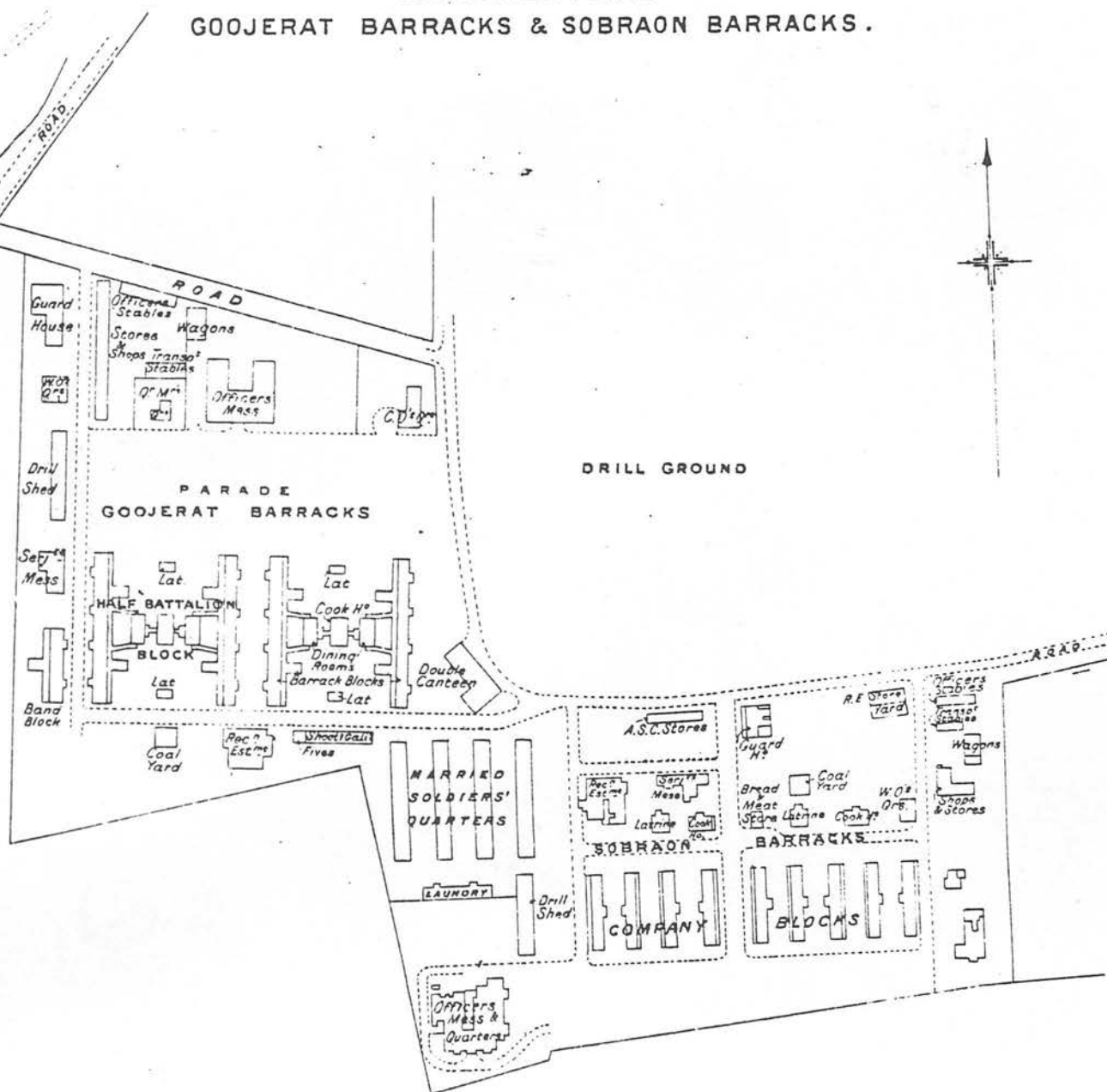


Fig. 2.  
Long side of Site running N. & S.  
Length 3100 ft.  
Breadth 1200 ft.  
Area 87° 5' 24" P.

25. Typical site plans for a Brigade of Infantry in the UK (1900).

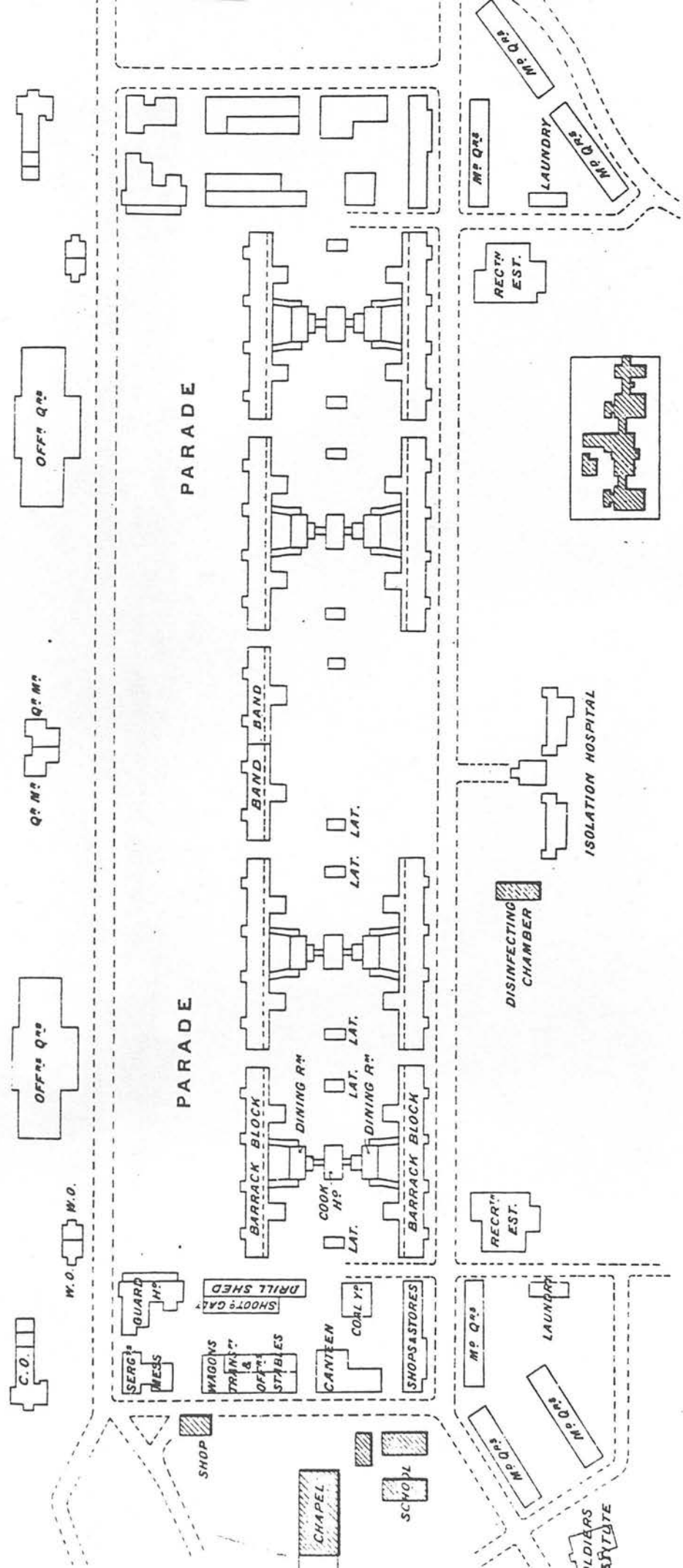


# COLCHESTER. GOOJERAT BARRACKS & SOBRAON BARRACKS.



26. Site plans of Goojerat and Sobraon Barracks in Colchester(1900).

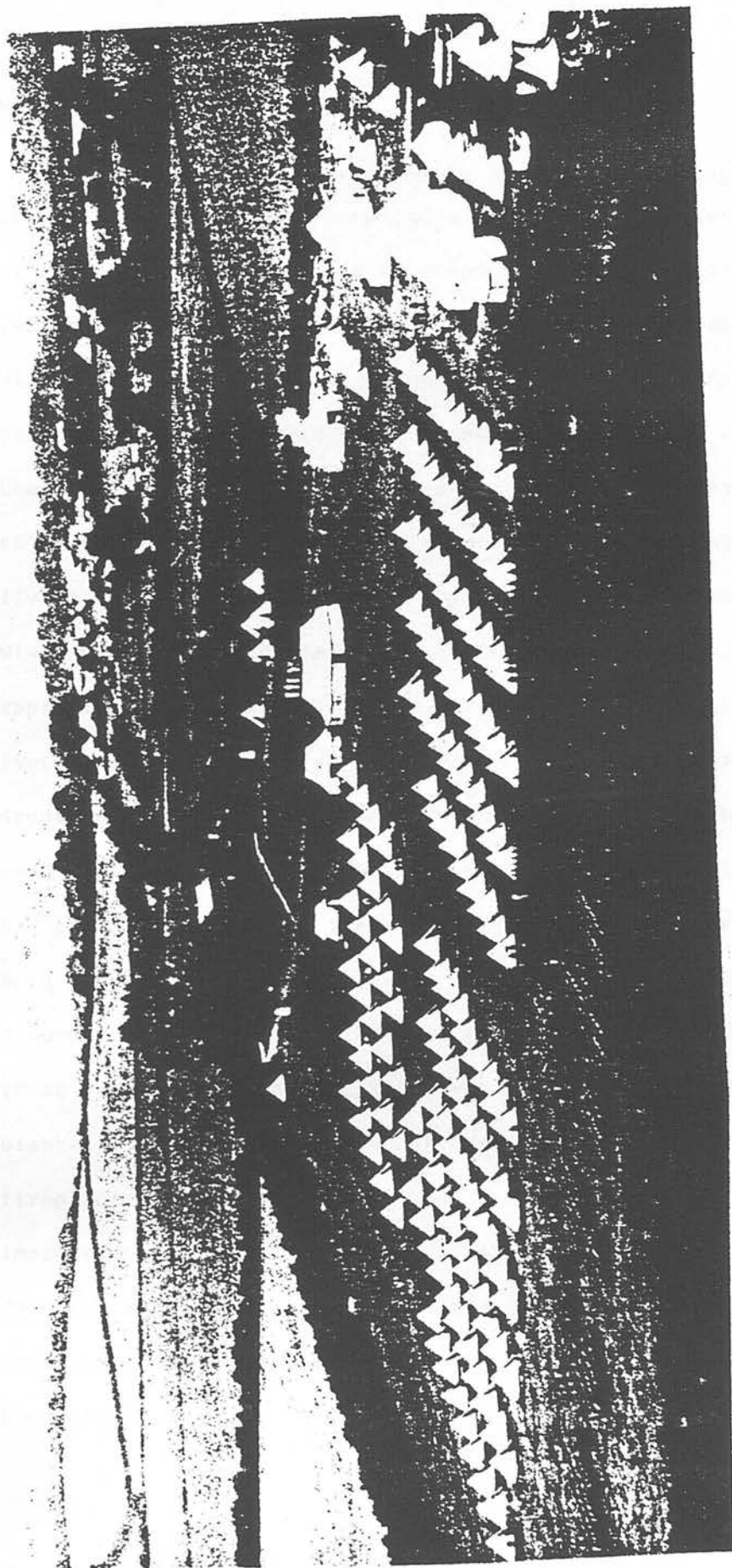
# SITE PLAN.



Scale 2500



27. Site plan of Curragh-Gough and Keane Barracks (1900).



28. Military Camp in the UK (1900).

## Married Soldiers' Housing

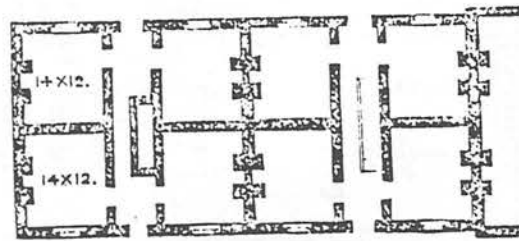
When Barracks first came to be established in England in 1792<sup>19</sup> it was apparently the custom for a married soldier to acquire one corner of the Barrack room for his wife and children. The privacy necessary for married life, was contrived by the simple expedient of hanging up blankets to form a screen. Instead of paying rent for this privilege, the soldier's wife would cook, clean and launder for the remainder of the unmarried male occupants of the room. The "corner" system gradually came to be recognised by the military authorities and regulations for married living accommodation were drawn up. Under these rules, the number of wives permitted in Barracks was limited to one per Barrack room, or approximately one wife to every twelve men. It is claimed that this system improved the moral standards of soldiers in Barracks by curbing drunkenness and profanity and creating cleaner, more healthy living conditions. By about 1850, when social conditions throughout Britain had generally improved, the concept of the "corner" became less acceptable. Some regiments created the first segregated married quarters, by allocating a number of Barrack rooms for the sole occupation of married soldiers and their families. Family privacy was still only achieved by screens of blankets or canvas, and eight or ten wives had to share the one common fireplace for cooking and warmth. From 1860 onwards, reforms and improvements to married accommodations gradually took place and when new Barracks were constructed, a limited number of permanent married quarters were usually provided, separated from the unmarried soldiers accommodation but within the confines of the Barrack area.

19. Prior to this date there were some Barracks built in Ireland where lack of Inns made them essential. Even so, in the troubled stage of the country, they could be regarded more as Police posts than anything else because the regiments were scattered in penny packets over several counties.

In their early form, such quarters were provided as single rooms without regard to family size, often in double storey buildings similar in design to a Barrack block for unmarried soldiers' (fig.29). Such blocks were served by an external staircase and a central corridor, and with communal cooking and ablution facilities. It was in conditions such as these at Aldershot<sup>20</sup>, where the majority of families still occupied wooden huts and Barrack rooms, that the fever epidemic of 1864 occurred. This was improved on by the addition to each quarter, a kitchen and scullery. Later came the "attic" and "depot" types in which differences were made in the number of rooms and the style of finish according to the rank of the occupant. Up to this time, domestic conveniences were entirely detached from these quarters. The conveniences were, however, arranged at the end of the blocks in the "verandah" type. The quarters were eventually reduced to three "a", "b", and "c". The "a" quarter had one bedroom, "b" had two, and "c" three, besides in all cases a living room and scullery. The later types added to these a separate W.C. to every quarter (fig.30). There was also the cottage type, an adaptation of the depot type as shown in Fig.31.) Each quarter had four rooms (i.e. "b" quarter) - living room, scullery and two bedrooms, with W.C. and each pair were so arranged that by throwing one bedroom of any one quarter into the next, a three and a five-roomed quarter resulted i.e. and "a" and "c" quarter in place of two "b's".

20. Where in one room, a Soldier, his wife and children were obliged to live, eat and sleep in very questionable comfort.

—MARRIED SOLDIERS' QUARTERS, PRESTON BARRACKS.

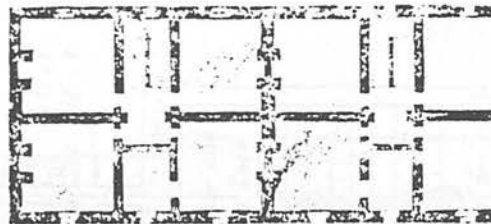


GROUND PLAN.

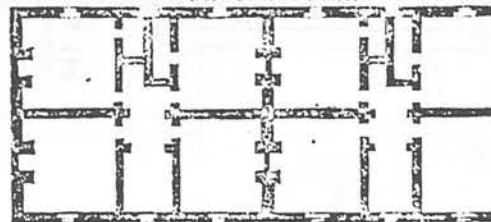
29a. Plan of Married Soldiers quarters, Preston Barrack (19th Century). Each family occupied a room of 4m x 3.5m.

MARRIED SOLDIERS' QUARTERS, BEGGARS BUSH BARRACK, DUBLIN

SECOND STORY.



GROUND PLAN.



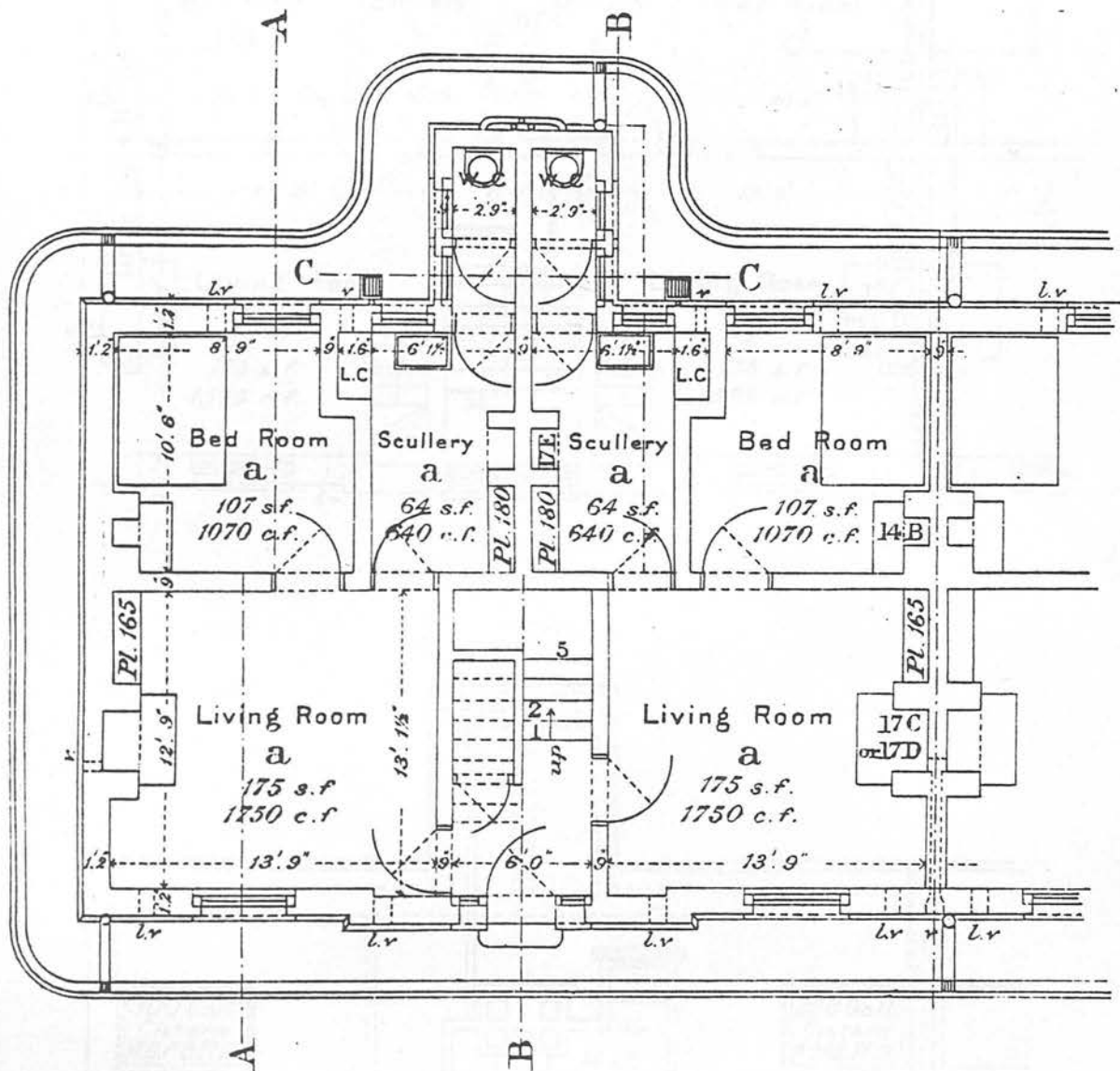
SCALE OF 0 10 20 30 40 50 FEET

29b. Plan of Married Soldiers' quarters, Beggars Bush Barrack, Dublin.



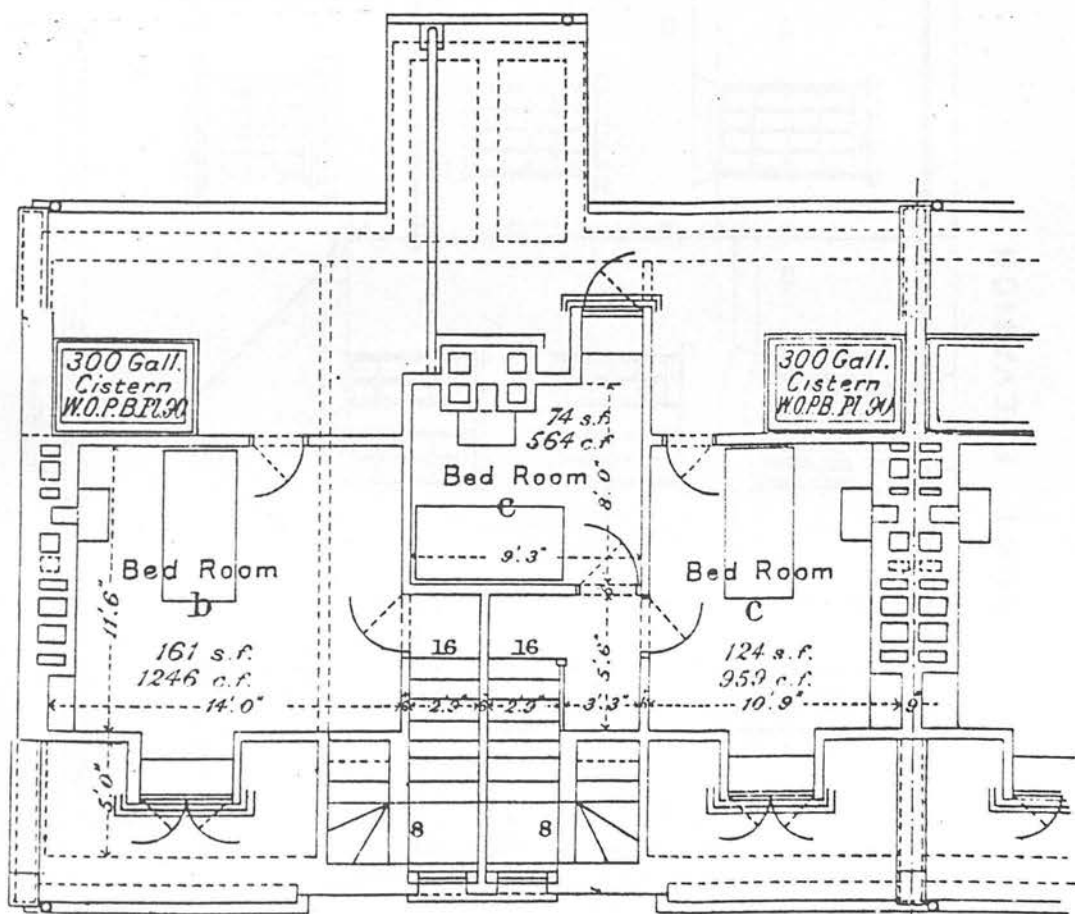
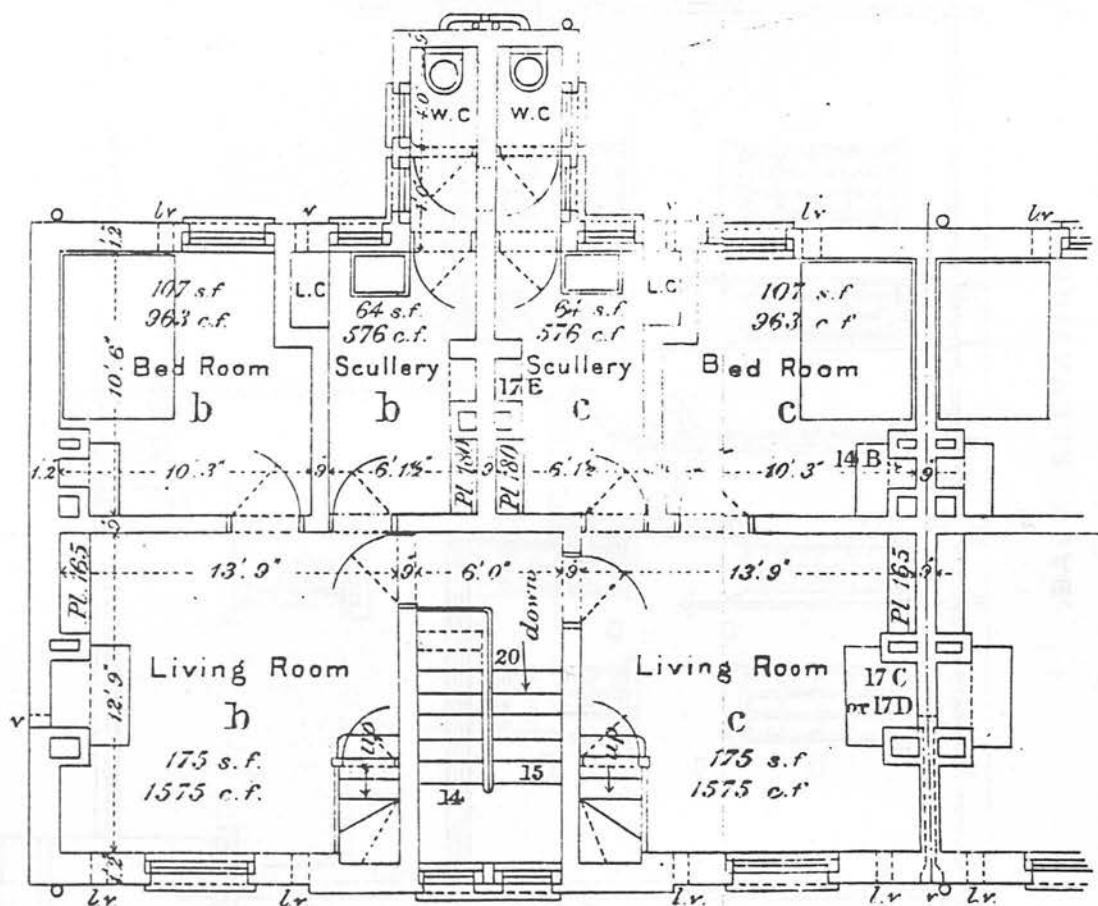


30a. Ground floor plan of Married soldiers' quarters types "a", "b" and "c" (self contained with verandah)

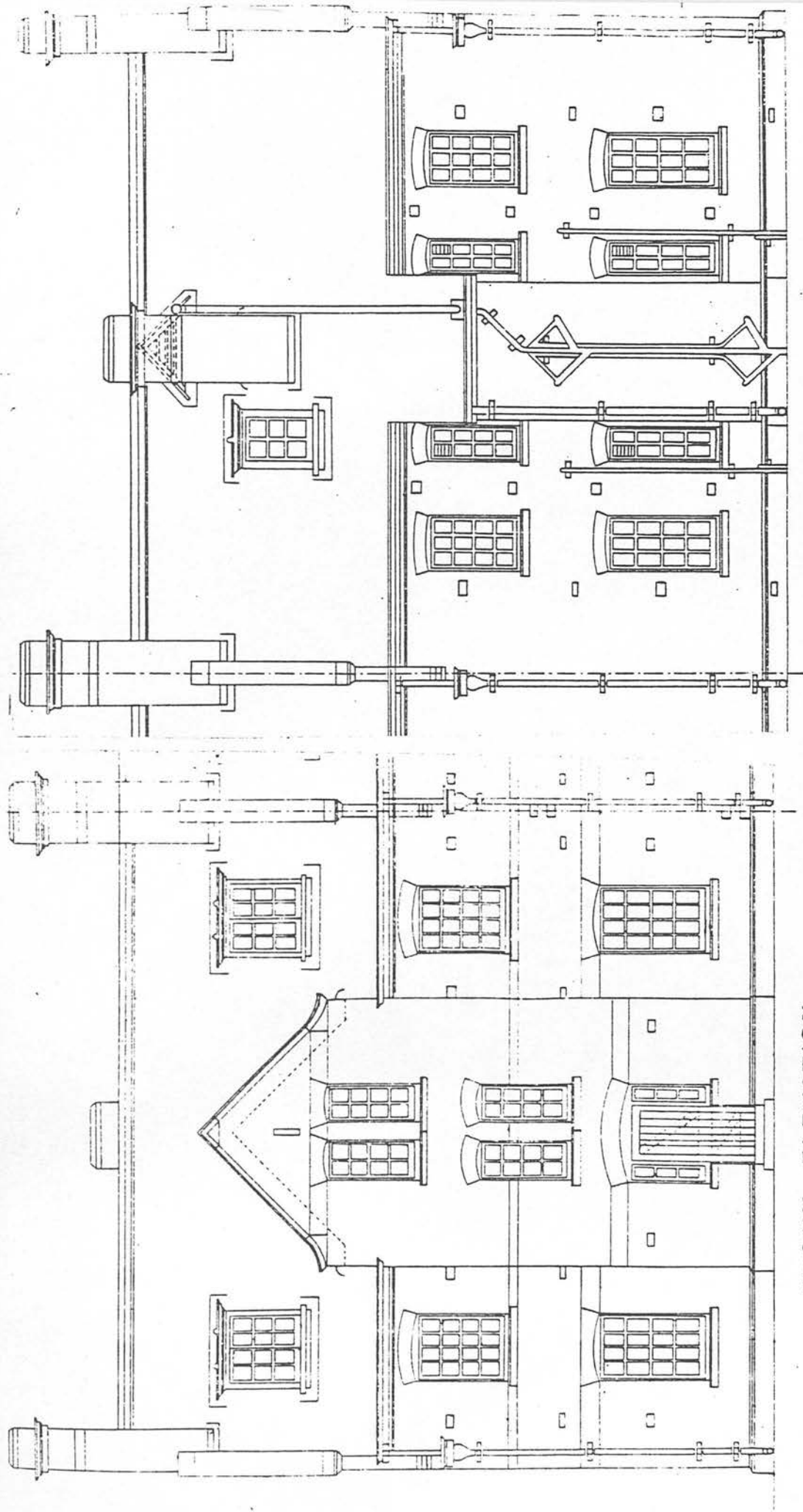


PLAN OF GROUND FLOOR

30b. Ground floor plan of Married Soldiers' quarters types 'a', 'b', and 'c' (self contained attic type).



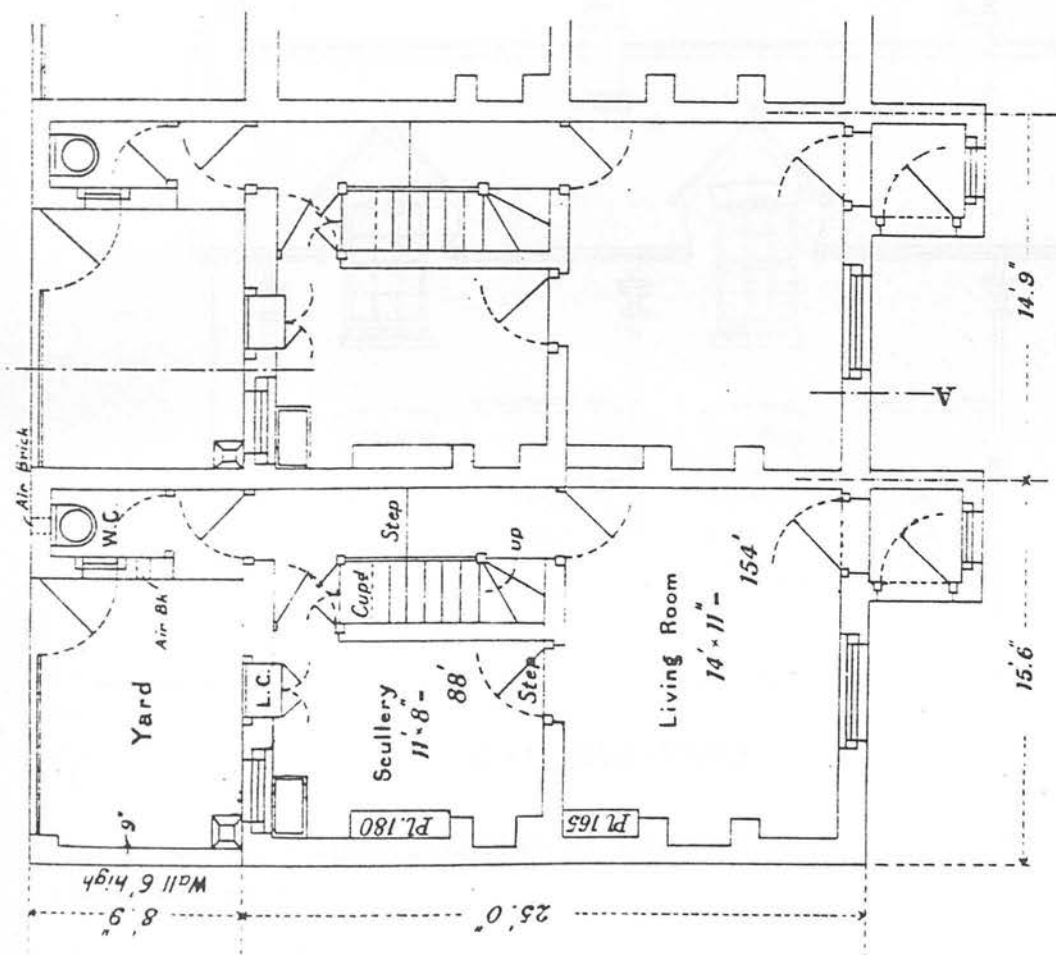
30c. First floor(top) and attic floor(below) plans of Married soldiers' quarters types 'a', 'b' and 'c' (self contained attic type).



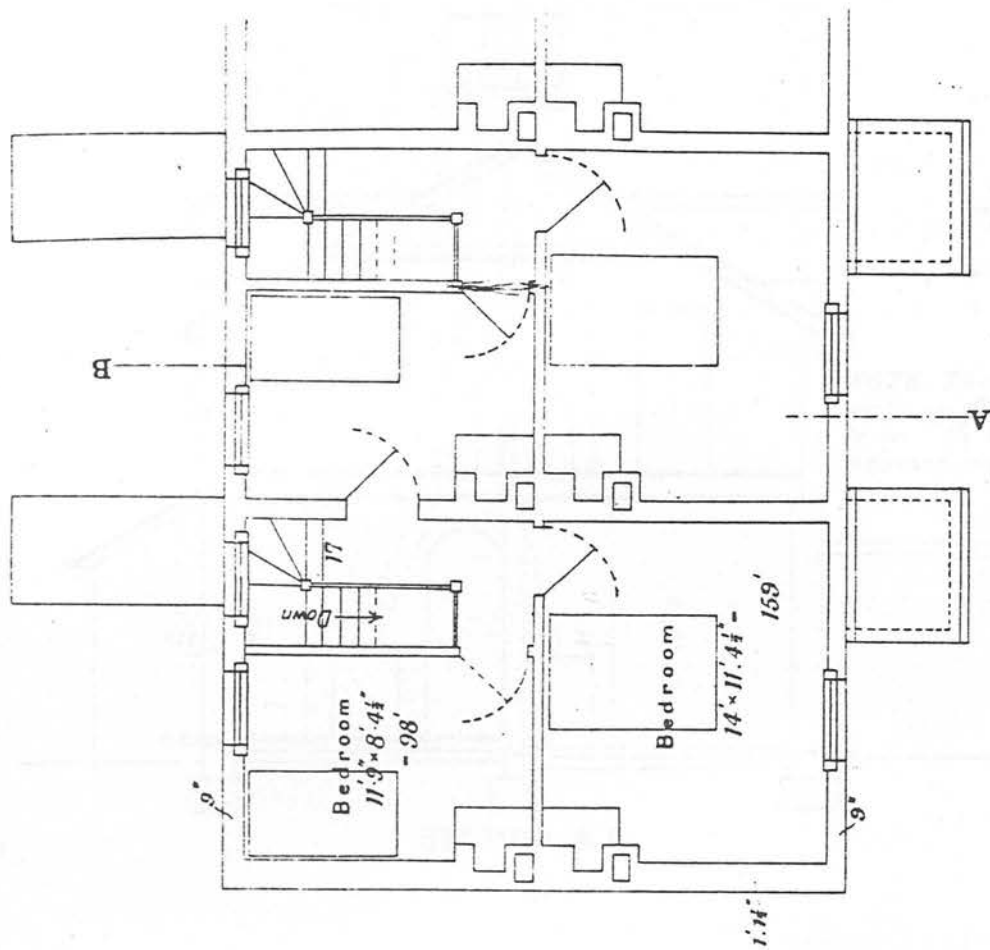
FRONT ELEVATION.

BACK ELEVATION.

36d. Front and Rear elevations of Married soldiers' quarters types 'a', 'b' and 'c' (self contained attic type).

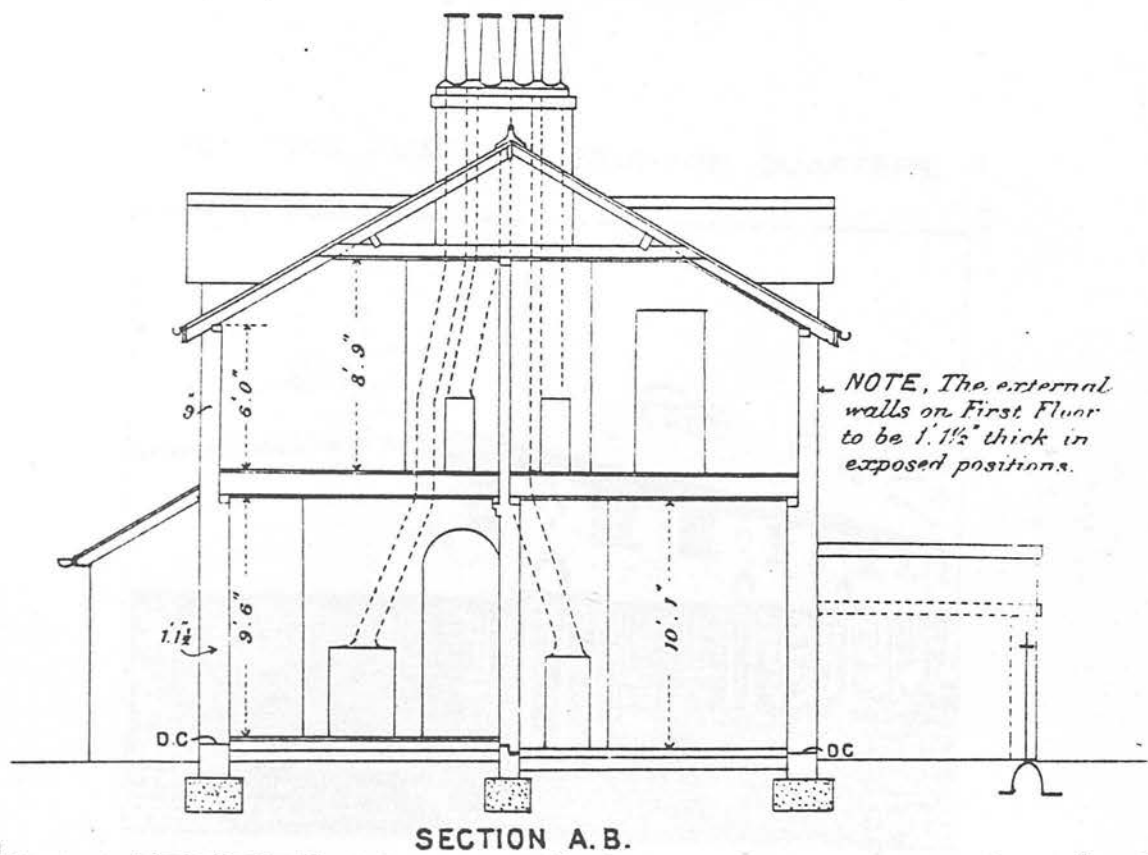


GROUND PLAN



FIRST FLOOR PLAN.

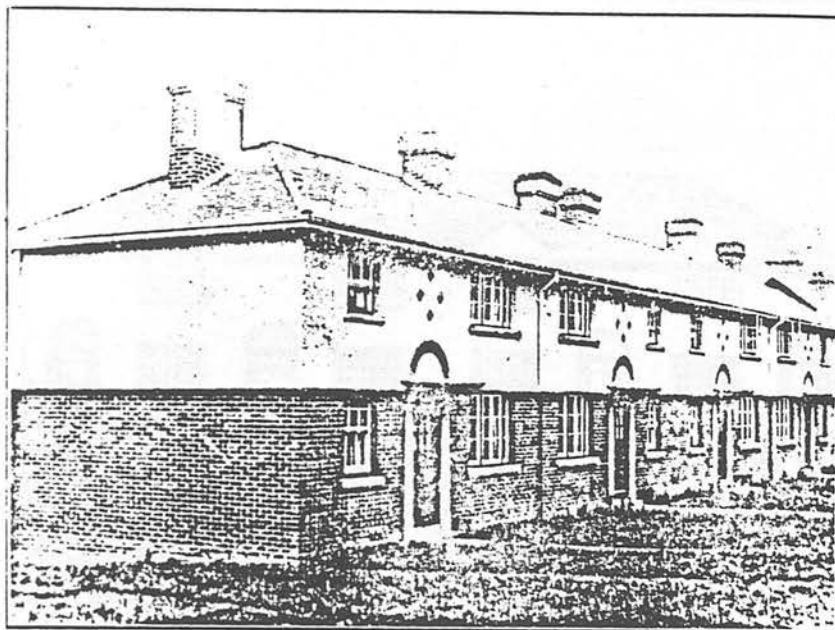
3la. Ground and first floor plans of Married soldiers' quarters cottage type.



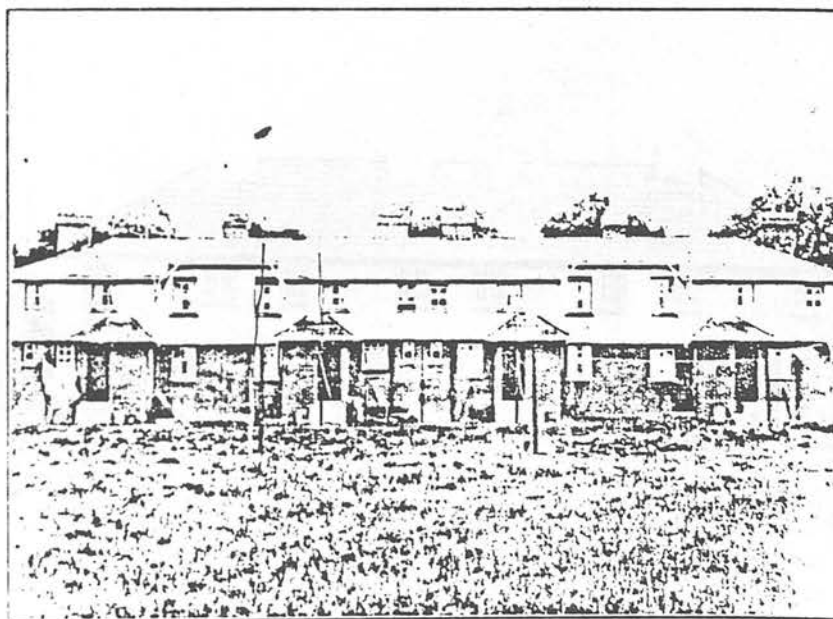
31b. Section and elevation of Married soldiers' quarters.  
Cottage type.



"C" TYPE.—MARRIED SOLDIERS' QUARTERS.



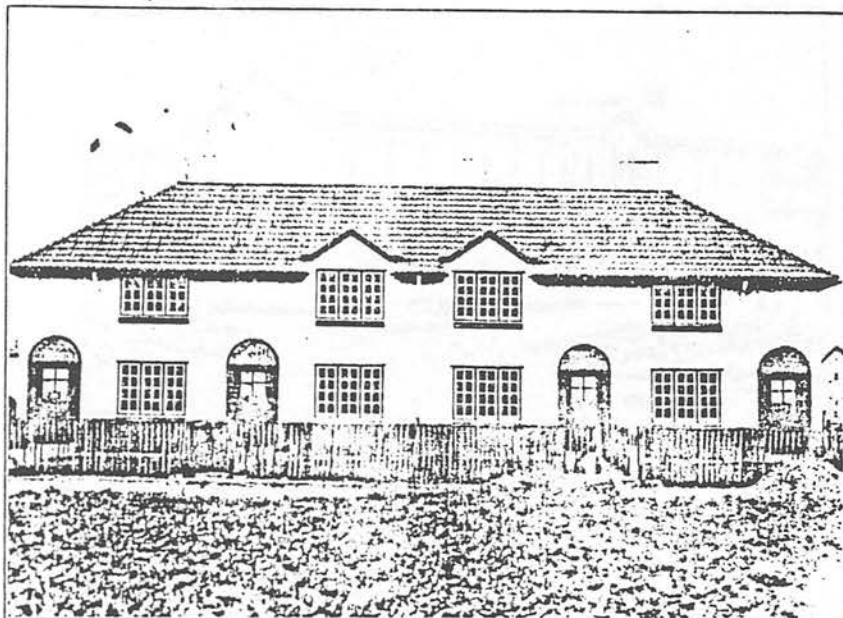
—Front.



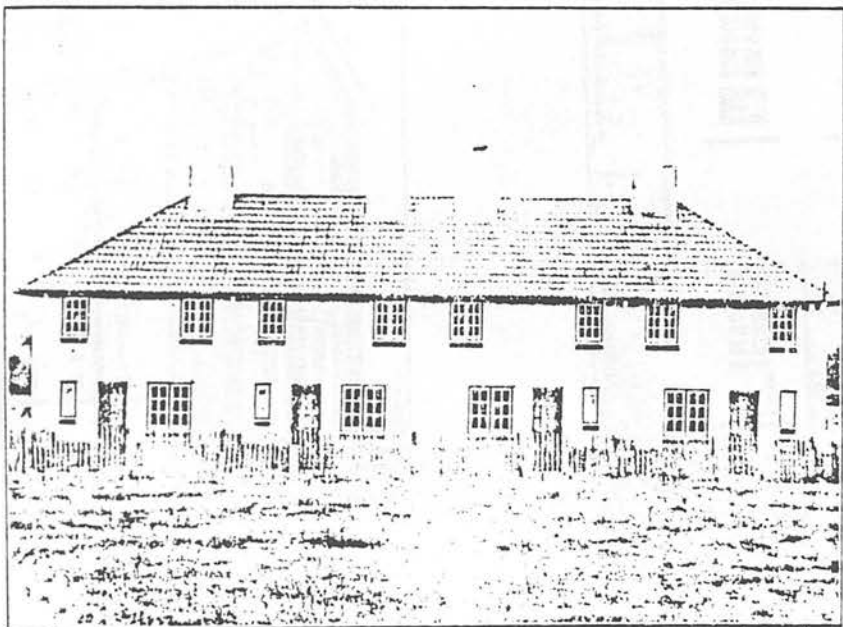
—Back.

32. Front and rear views of Married soldiers' quarters in 1927 (UK).

"B" TYPE. -MARRIED SOLDIERS' QUARTERS.



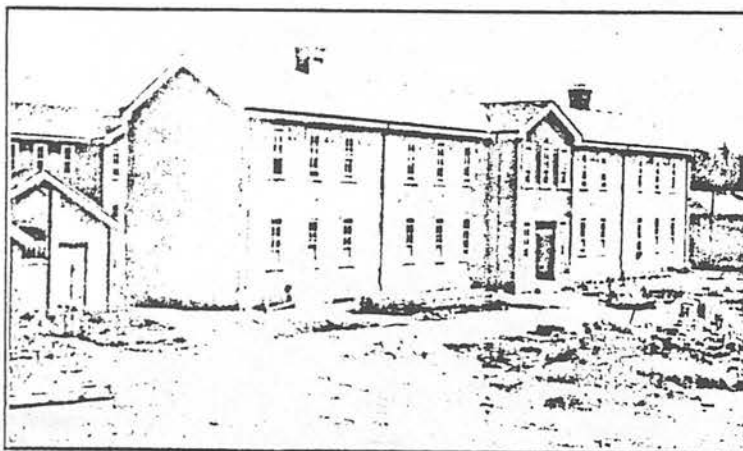
—Front.



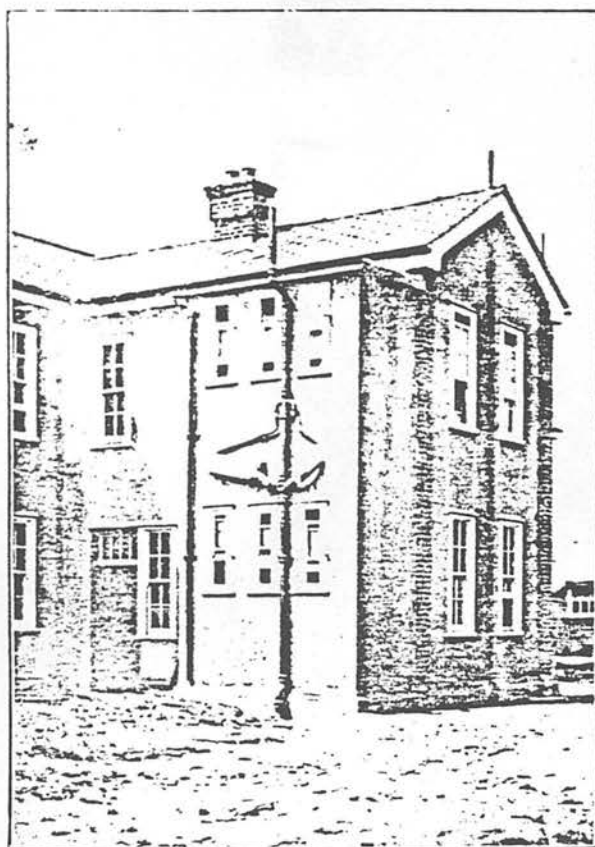
Back.

33. Front and rear views of Married soldiers' quarters, type "b" in 1927 (UK).

DOUBLE STORIED BARRACK BLOCK.



Front.



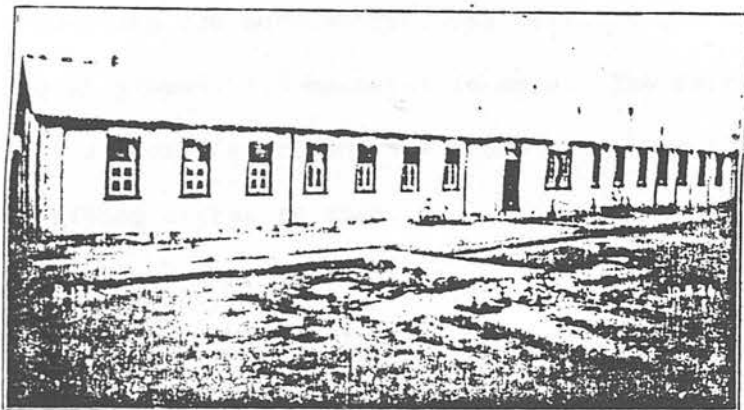
—Sanitary Annexe.



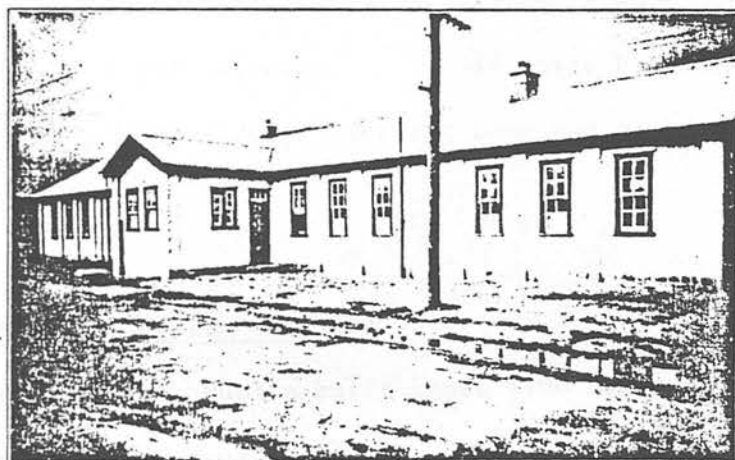
Front Entrance.

34. Different views of the Double storied Barrack room block in 1927 (UK).

SINGLE STORED BARRACK BLOCK.



—Front.



—Back.

35. Front and rear views of the Single storied Barrack room block in 1927 (UK).

## Barrack Plans

The following Barrack Plans illustrate some of the points mentioned earlier.

a. Hyde Park Cavalry Barrack, London (Fig.36)

Hyde Park Cavalry Barrack was constructed at the end of the eighteenth century to accommodate 536 non-commissioned officers and men, with horses, on a long strip of ground, 1.5 hectares in area. The Barrack room blocks were built round a closed court and the rooms were over the stables with long corridors giving access to them.

b. Wellington Barrack, London (Fig.37)

The original buildings of this Barrack were erected in 1832/33. This occupied an area of 3 hectares and accommodated 1,530 non-commissioned officers and men of the infantry. It had large blocks which consisted of Barrack rooms placed side to side and some had corridors covering one side of the rooms.

c. Royal Barrack, Dublin (Fig.38)

The Royal barrack, Dublin built about 1700 had some of its buildings erected round a closed square. It occupied an area of 5.6 hectares and accommodated 1,917 men. There were narrow lanes between the blocks. The men's rooms around the stable square were over the stables. One side of the Barrack rooms in the Royal and Palatine squares was covered by a glazed corridor and had windows on the other side only.

d. Clarence Barrack, Portsmouth (Fig.39)

Built in the eighteenth century, within the town, the Clarence Barrack stood on 0.5 hectares of ground and accommodated 912 men. The blocks were built round a closed court.

e. Castle and Shambles Barracks, Galway (Fig.40)

The Castle and Shambles Barracks were also erected in the eighteenth century within a built up area. Castle Barrack was for both infantry and cavalry, and accommodated 120 men on an area of 3,145 sq metres. Shambles Barrack occupied 1,564 sq.m. and accommodated 256 men. Both plans show narrow closed courts surrounded by high buildings.

f. Linen-Hall Barrack, Dublin (Fig.41)

This was an eighteenth century Barrack with buildings which were not originally intended for soldiers. It consisted of a number of small closed courts and buildings which accommodated 1,094 non-commissioned officers and men, on 1 hectare of land.

g. Hulme Cavalry Barrack, Manchester (Fig 42)

Hulme Cavalry Barrack was built in 1793 to accommodate 423 men, and occupied 3 hectares of land on the outskirts of Hulme. The Barrack rooms were re-built in 1829 over the stables, and were all of equal size with 10 men in each.

h. Parsonstown barrack, Parsonstown (Fig.43)

This was one of the Irish Barracks built during the first half of the nineteenth century. The Barrack room blocks consisted of one long central block, with an archway through the middle of its length, and two detached blocks at the ends. it accommodated 1,105 men. The blocks had central corridors with the rooms left and right of it.

i. Naas Barrack, Naas (Fig.44)

Another nineteenth century Irish Barrack, Naas Barrack was built to accommodate 360 men and had a similar block plan to the Parsonstown barrack.



j. Bury Barrack, Manchester (Fig.45)

The Bury Barrack erected in 1845 on a 3 hectare land, accommodated 338 non-commissioned officers and men. it contained accommodation for both infantry and cavalry, with the buildings laid out round a square which was used as a parade ground for the infantry.

There were altogether 20 Barrack Rooms. The Cavalry Barrack rooms, built over stables, occupied one block on one side of the square. Infantry occupied the corresponding block on the opposite side. On the remaining two sides were the officers' quarters, hospital, guardroom, Barrack offices, etc. Behind each block of Barrack rooms was the cookhouse and the soldiers' privies.

k. Chichester Barrack, Chichester (Fig.46)

A nineteenth century Barrack, built on an open site, occupied an area of 9 hectares and consisted of Barrack huts mainly. The huts were of wood, resting on brick foundations. Each infantry hut contained 14 men, and each cavalry hut 13 men. There were huts for horses also.

l. Dundalk Cavalry Barrack, Dundalk (Fig.47)

Another nineteenth century Barrack, constructed for 352 men, who were accommodated in four blocks of buildings, each block consisting of two floors of rooms. The stables were in 10 one storey buildings, located at one side of the parade ground.

m. Brompton Barrack, Chatham (Fig.48)

This Barrack built in early nineteenth century, occupied 5 hectares of land, was located on the slope of a hill with the barrack room blocks occupying the lower part of the hill side. Above these, was the parade ground, and higher than the parade ground were the officers' quarters.

There were 176 Barrack rooms which accommodated 2,700 men. The rooms were placed side by side, with windows on one side. They measured 4.5m x 6 m x 2.7m and accommodated 8 men each.

n. Birmingham Cavalry Barrack, Birmingham (Fig.49)

This Barrack also built in early nineteenth century accommodated 180 men, on a 2.2 hectare land. It was built on two levels: on the higher level were the officers' quarters, Barrack room Blocks, stables and parade ground; on the lower, were the Barrack offices, workshops and canteen, built around a space laid out as the cavalry exercising ground.

Each block had Barrack rooms over stables. The rooms were reached by means of stone staircase in the middle of the block, which led to a long corridor with the rooms left and right of it. The rooms were all of the same size, 8.5m x 5.1 m x 3m.

o. Royal Artillery Barrack, Northampton (Fig.50)

The Artillery Barrack was constructed at the end of the eighteenth century on a 3.7 hectare land, located at the outskirts of Northampton. It accommodated 218 men.

The guardroom, canteen, cells and one or two offices were placed close to the gate. Opposite these, at a short distance were three blocks of buildings:

the centre block contained the officers' quarters and each of the side blocks contained the stables on the ground floor with Barrack rooms over them. Access to the rooms was by a staircase and a long corridor.

p. Sheffield Barrack, Sheffield (Fig.51)

Sheffield Barrack, built in 1849, accommodated 848 non-commissioned officers and men, and was located 2.5km from the Sheffield town. The buildings were of brick and faced with stone. The Barrack room blocks were of two types. The cavalry blocks had the rooms over the stables. The staircases that led to these rooms were between every two stables, and each gave access to two rooms and a sergeant's room on the upper floor. The infantry blocks had, instead of the stables on the ground floor, Barrack rooms.

q. Salford Infantry Barrack, Manchester (Fig.52)

Salford Barrack, built in the early nineteenth century, accommodated 947 non-commissioned officers and men on 3.6 hectares of land. The buildings were erected in 1821 and were arranged round a square, with the Barrack room blocks on two opposite sides; officers' quarters and the hospital on a third side; opposite the officers' quarters, on the fourth side were the Barrack offices. The latrines, wash houses, cook houses etc. were located behind these blocks and close to the perimeter wall.

r. Burnley Barrack, Burnley (Fig.53)

Burnley Barrack, built also in early nineteenth century, accommodated 118 cavalry, and 136 infantry non-commissioned officers and men, and was located 2.5km from Burnley town on an area of 2 hectares.

The buildings were mainly on three sides of the square, with a ball court on the fourth.

The rooms in the cavalry block were built over the stables. The block had a staircase which led to a corridor on the upper floor where the rooms were. The infantry block had rooms on both floors. Each room accommodated 12 men with about 9 cubic metres per man.

s. Ashton Barrack, Ashton (Fig.54)

Built in 1845, Ashton Barrack accommodated 332 non-commissioned officers and men, and occupied an area of 3 hectares, 2.5km from Ashton. The general layout and construction of the buildings were similar to that of Bury Barrack (Described earlier).

t. Fulwood Barrack, Preston (Fig.55)

Built in 1848, it accommodated 1,742 non-commissioned officers and men of infantry, cavalry and artillery. It occupied an area of 11 hectares and was 2.5 km from the town of Preston. From the plan, the buildings were arranged around two squares, separated from each other by the officers' quarters. The infantry blocks occupied two opposite sides of the first square next to the entrance gate. The cavalry and artillery blocks were on two sides of the second square.

Both the layout and the Barrack room type in this Barrack, was similar to those of Ashton and Bury Barracks.

u. York Cavalry Barrack, York (Fig.56)

York Barrack, located 1.5km south of the city of York, was built in 1845 to accommodate 336 non-commissioned officers and men. The Barrack buildings were on three sides enclosing a large parade and exercise ground.

The barrack room type was similar to those of other cavalry barracks described earlier. Stables on the lower floor, staircase leading to the corridor, with the barrack rooms on both sides of it.

v. Leeds Barrack, Leeds (Fig.57)

Leeds Cavalry Barrack was situated on the outskirts of Leeds town. It had the officers quartered in one block, and the men's Barrack rooms in three blocks, all extending in a line. The Barrack rooms were built over the stables, each accommodating 12 men. The riding school and exercising ground were on the eastern end of the Barrack.

The Barrack accommodated 360 non-commissioned officers and men.

w. Sunderland Barrack, Sunderland (Fig.58)

Sunderland Barrack was built in the early part of the nineteenth century on the eastern end of Sunderland town. it occupied an area of 3 hectares and accommodated 316 non-commissioned officers and men. The buildings were built round a parade, with the officers' quarters on the entrance side, and the Barrack room blocks one on each side at right angles to the officers' block. The lavatories, wash houses, cookhouses etc. were located behind these blocks, close the wall fence.

Each block of Barrack rooms had rooms on both the ground and first floors. It had three external staircases, with a projecting porch over the upper entrance of each. There were 20 men per room with about 10.6 cubic metres per man.

x. Edinburgh Castle, Edinburgh

The buildings of Edinburgh Castle cover an irregularly shaped area of 4.4 hectares. The structures were of different periods some of great antiquity.

The more ancient buildings were the Palace, part of which was used for the canteen and for soldiers' quarters; the Parliament Hall, used as a hospital. At the end of the eighteenth century, a large block of Barrack rooms was built and the Governor's house, ordinance stores and the expense magazine were later converted into Barrack rooms in the early nineteenth century.

The large block had 53 Barrack rooms, arranged on floors reached by four staircases and a long corridor on each floor. At both ends of the corridors on each floor, were officers' quarters. The rooms were averagely 5.5m x 5m x 2.7m in size. The block accommodated 447 men. The basement which was arched, accommodated the married men. The older buildings on the summit of the Castle used as Barrack Room, accommodated 134 men.

y. Berwick-on-Tweed Infantry Barrack

Built in late eighteenth century it had its buildings set around a square. The Barrack room blocks were two, three-storey high stone buildings, which formed two sides of the square. The gate formed the third side, and located on the fourth, were buildings used as cells, stores etc. There were 72 Barrack rooms on the whole which accommodated 720 men. The rooms measured the same 6m x 5m x 2.5m.

z. Glasgow Infantry Barrack, Glasgow

Built about 1800, Glasgow Barrack accommodated 792 non-commissioned officers and men, and occupied an area of 2 hectares on the east end of Glasgow. The Buildings were built around the parade ground.



It consisted of two blocks of Barrack rooms, one on either side of the parade ground, with the officers' block on the third side. The blocks were four stories high and consisted of rooms 8m x 6m x 2.8m in size, accommodating 12 men each.

aa. Fort George Inverness (Fig.59)

Fort George was considered one of the outstanding artillery fortifications in Europe. Work started on it in 1748 and continued until 1769. Within the sophisticated defences, were buildings that held two infantry battalions (1,600 men) and an artillery unit. The buildings were symmetrically planned.

The Barrack accommodation at that time consisted of two U-shaped blocks (north and south) two front blocks (north and south), and the casemates. The casemates were constructed under the ramparts and flanked the parade ground on the north and south. Each casemate held up to 40 men. the U-shaped blocks enclosed a large parade ground in the centre and had barrack rooms on each of the floors with corridors running through them. The officers' quarters were in the middle and end of the blocks. There were in them, 207 men's rooms and four rooms for sergeants, which accommodated 1,408 non-commissioned officers and men of the infantry. The two front blocks had an arcade on the ground floor, and above this, were rooms, arranged in pairs with windows on one side. These accommodated the artillery unit and the staff of the fort.

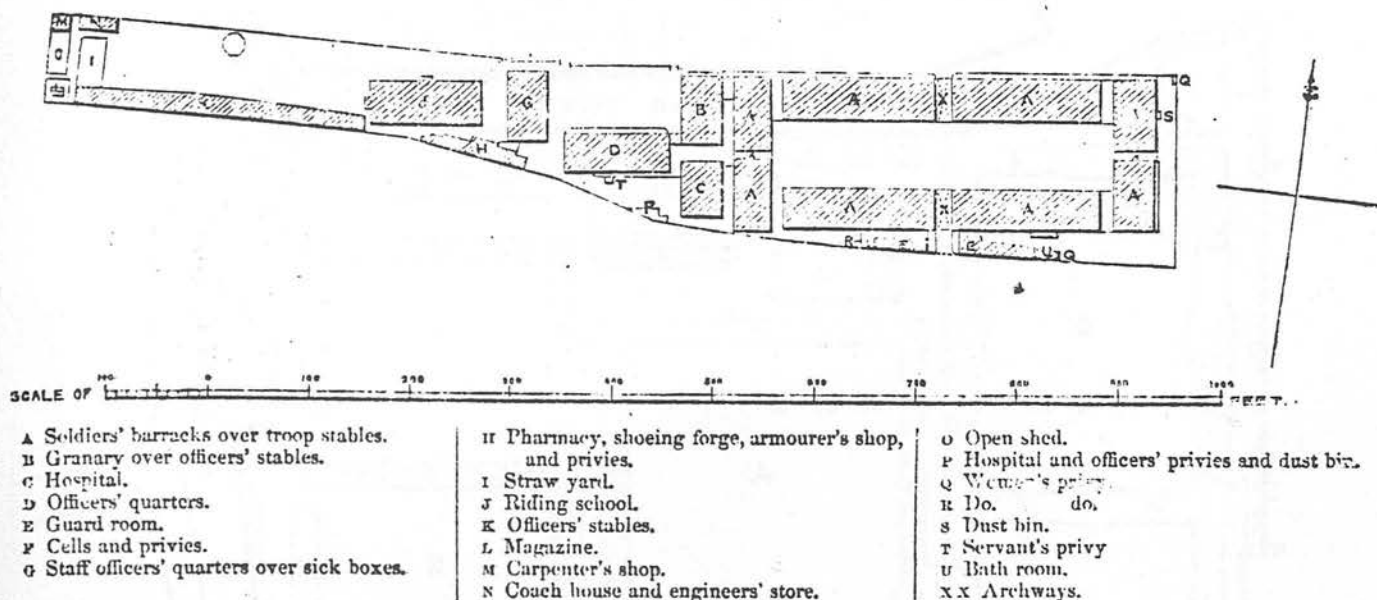
bb. Forton Barack, Forton (Fig.60)

The Barrack was redesigned by Captain James, R.E., and built in 1850, when it was required to accommodate a full Division of Marines which had 50 officers and 1,118 men on its strength.

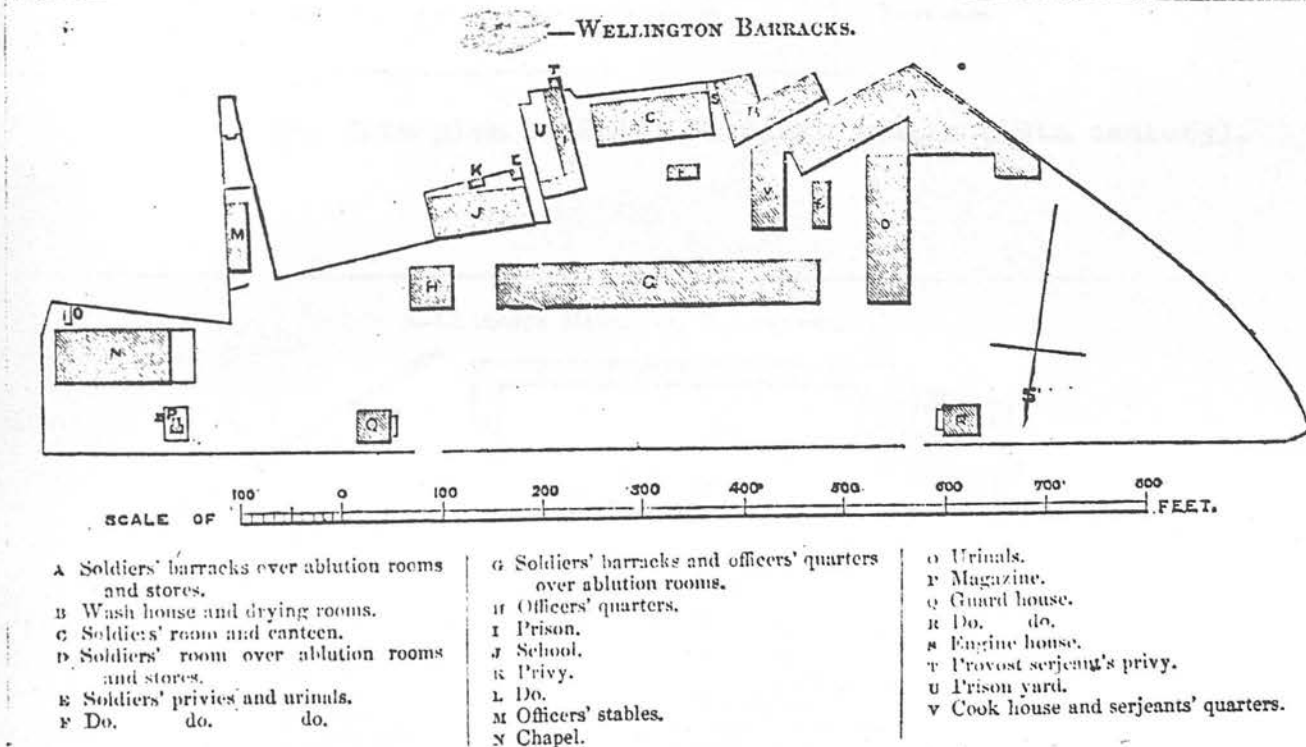
The original Barrack consisted of 4 pavilions and two blocks of officers' quarters. The pavilions were capable of accommodating 48 sergeants and 832 men; but the lower part of one pavilion was occupied as a mess establishment for the officers, another as a surgery and hospital, and part of the other pavilions were occupied as school rooms, tailor's shop, Barrack-master's and quartermaster's stores, the accommodation for the men was thus limited. The officers' quarters were also quite inadequate for a division of marines. it only afforded accommodation for one field officer, two captains and the subalterns.

In redesigning the Barrack to suit the Marines, the four pavilions were appropriated exclusively to the men (832 men, 24 sergeants and 24 staff sergeants) and an additional wing was built to accommodate the remaining men.

# —HYDE PARK CAVALRY BARRACKS.

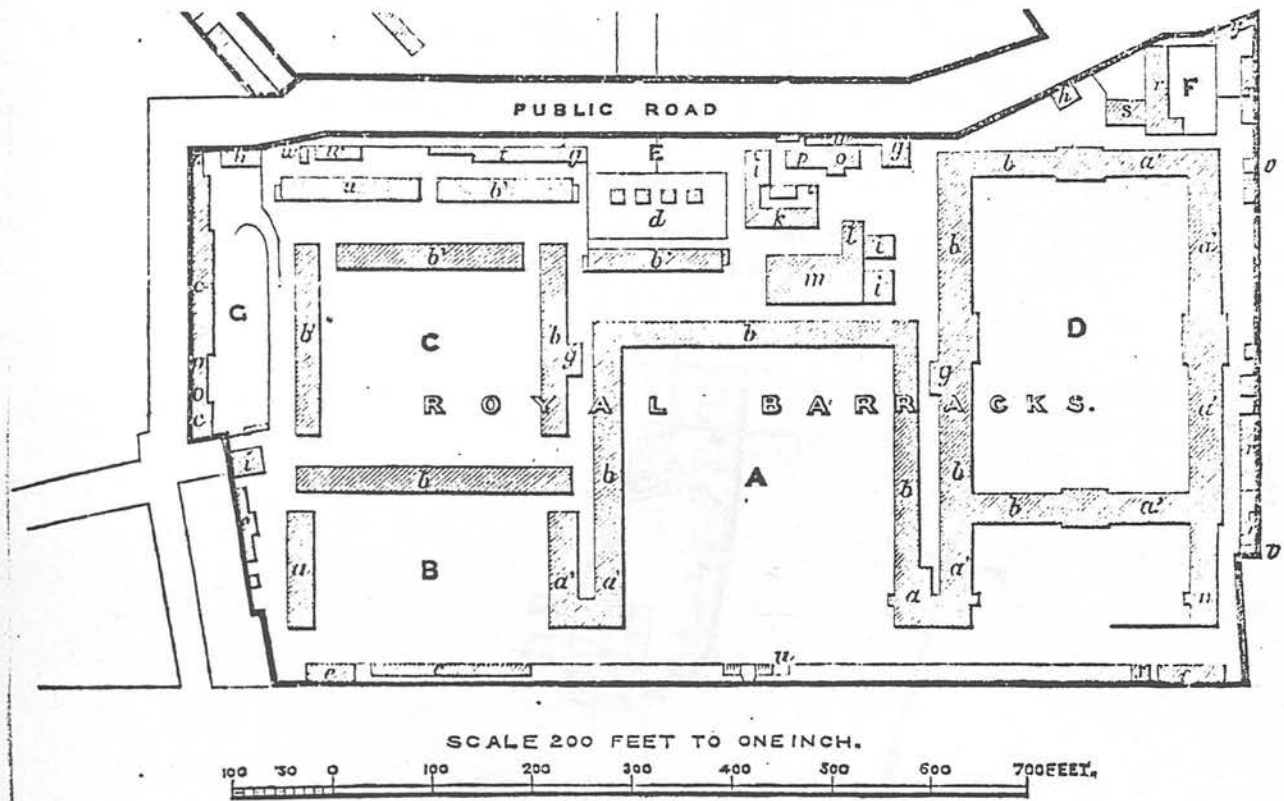


36. Site plan of Hyde Park Cavalry Barrack, London (19th century).



37. Site plan of Wellington Barrack, London (19th century).

—ROYAL BARRACKS DUBLIN.



- |                                     |                                      |   |
|-------------------------------------|--------------------------------------|---|
| A Royal square.                     | d Magazines.                         | p Armourers' shops.                             |
| B Cavalry square.                   | e Guard houses.                      | r Barrack stores.                               |
| C Stable square.                    | f Cells.                             | s Shoemakers' shops.                            |
| D Palatine square.                  | g Ablution houses.                   | t Farrier's sheds.                              |
| E Ball courts.                      | h Wash houses.                       | u Granary, over stables.                        |
| F Coal yard.                        | i Cook houses.                       | v Officers' privies.                            |
| G Drying ground.                    | k Canteen.                           | w Soldiers' privies.                            |
| g Major-General's quarters.         | l Canteen store.                     | x Engineer office and clerk of work's quarters. |
| a' Officers' quarters.              | m Riding school.                     | y Workshops.                                    |
| h Soldiers' quarters.               | n Barrack master's store and office. | z Straw store.                                  |
| u Soldiers' quarters, over stables. | o Barrack serjeant's quarters.       |   |
| e Officers' stables.                |                                      |   |

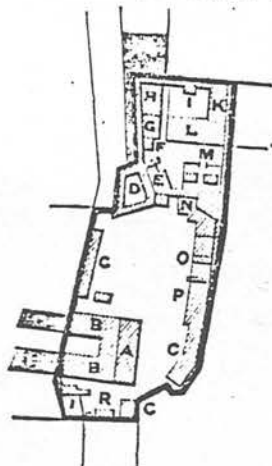
38. Site plan of Royal Barrack, Dublin (19th century).



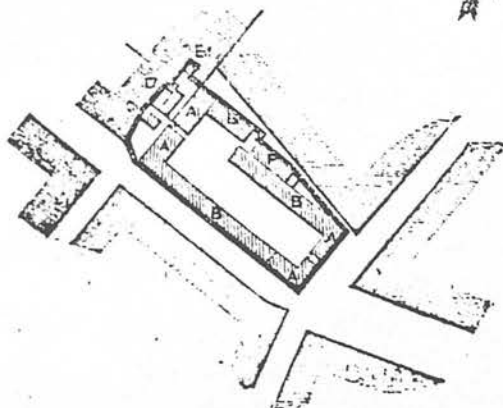
- |                       |                              |
|-----------------------|------------------------------|
| A Infant school.      | J Guard room.                |
| BB Cooking houses.    | K Staff serjeants' quarters. |
| CCCC Soldiers' rooms. | L Mess kitchen.              |
| D Officers' quarters. | M Serjeants' mess room.      |
| F School room.        | N Barrack store.             |
| G Barrack store.      | O Guard room and store.      |
| H Mess kitchen.       | P Privies.                   |
| I Orderly room.       | R Wash house.                |

39. Site plan of Clarence Barrack, Portsmouth (19th century).

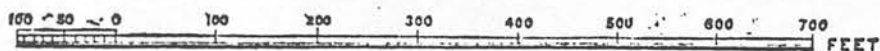
-GALWAY BARRACKS.  
CASTLE BARRACKS.



SHAMBLES BKS



SCALE 200 FEET = ONE INCH



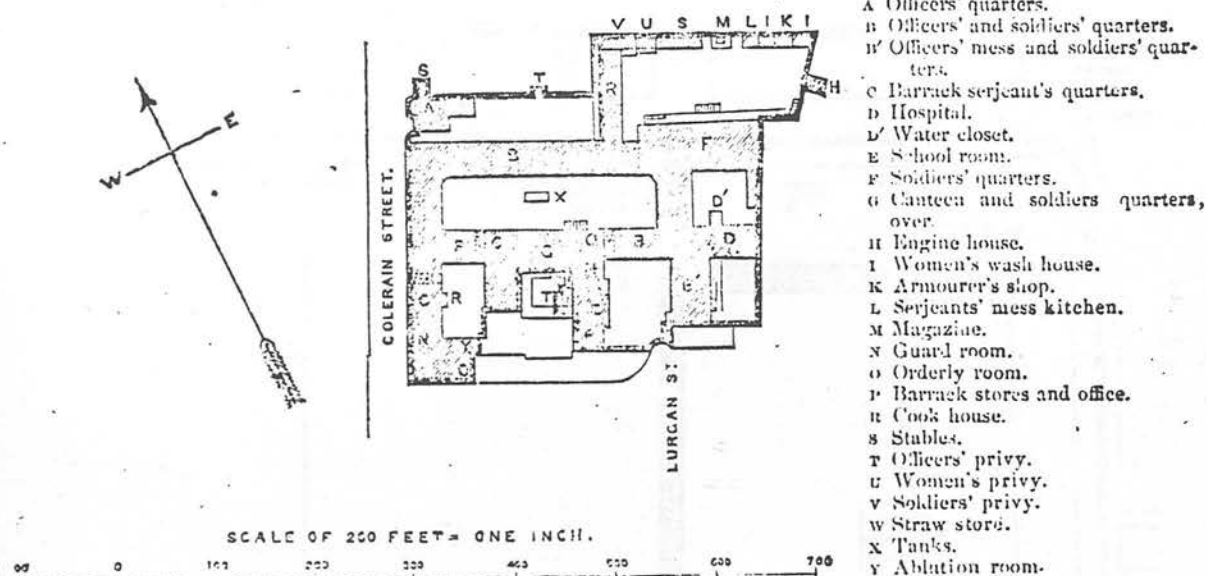
*Castle Barracks.*  
A Officers' quarters.  
B Soldiers' do.  
C Stables.  
D Coal yard.  
E Armourer's shop and shoeing shed.  
F Dead house.  
G Engineer store.

H Barrack store.  
I Privies.  
K Kitchen.  
L Hospital.  
M Magazine.  
N Barrack office.  
O Cell.  
P Engineer office and guard room.  
R Cook house.

*Shambles Barracks.*  
A Officers' barrack.  
B Soldiers' do.  
C Officers and non-commissioned officers' privies.  
D Men's privies.  
E Tank.  
F Stables.

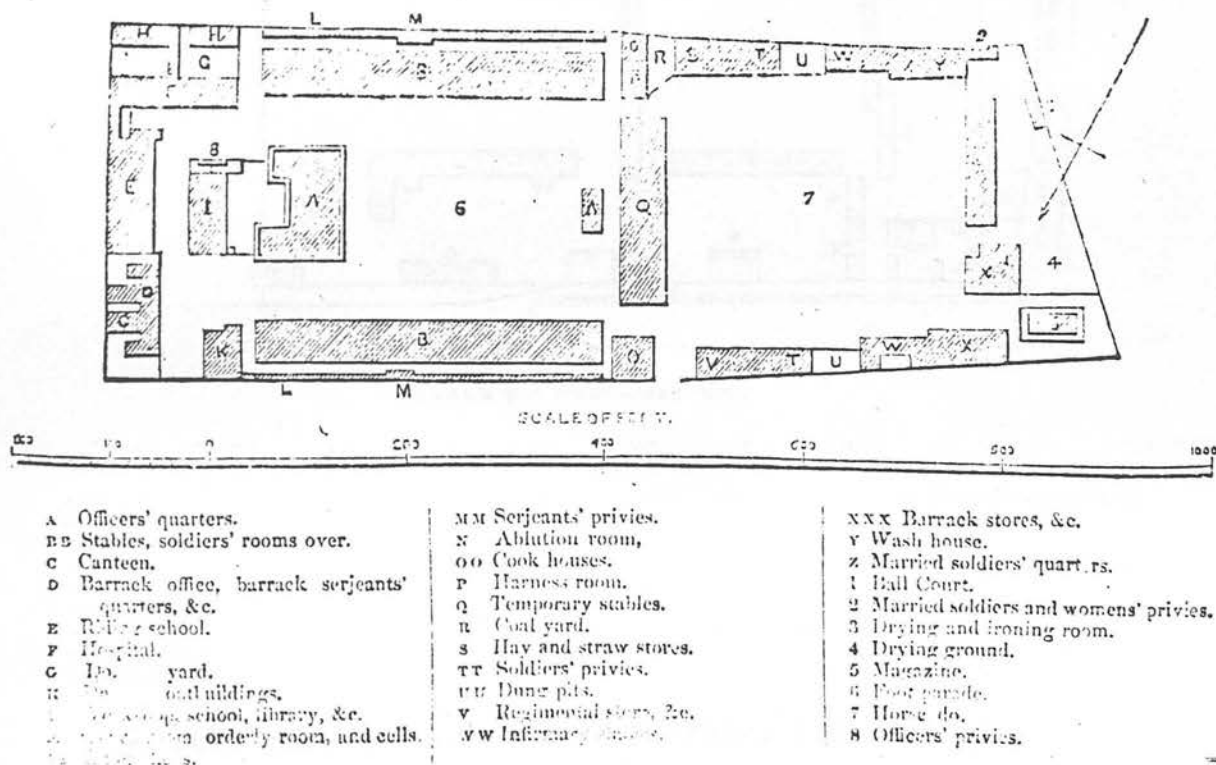
40. Site plans of Castle and Shambles Barracks, Galway (19th century).

—LINEN-HALL BARRACKS, DUBLIN.



41. Site plan of Linen-Hall Barrack, Dublin (19th century).

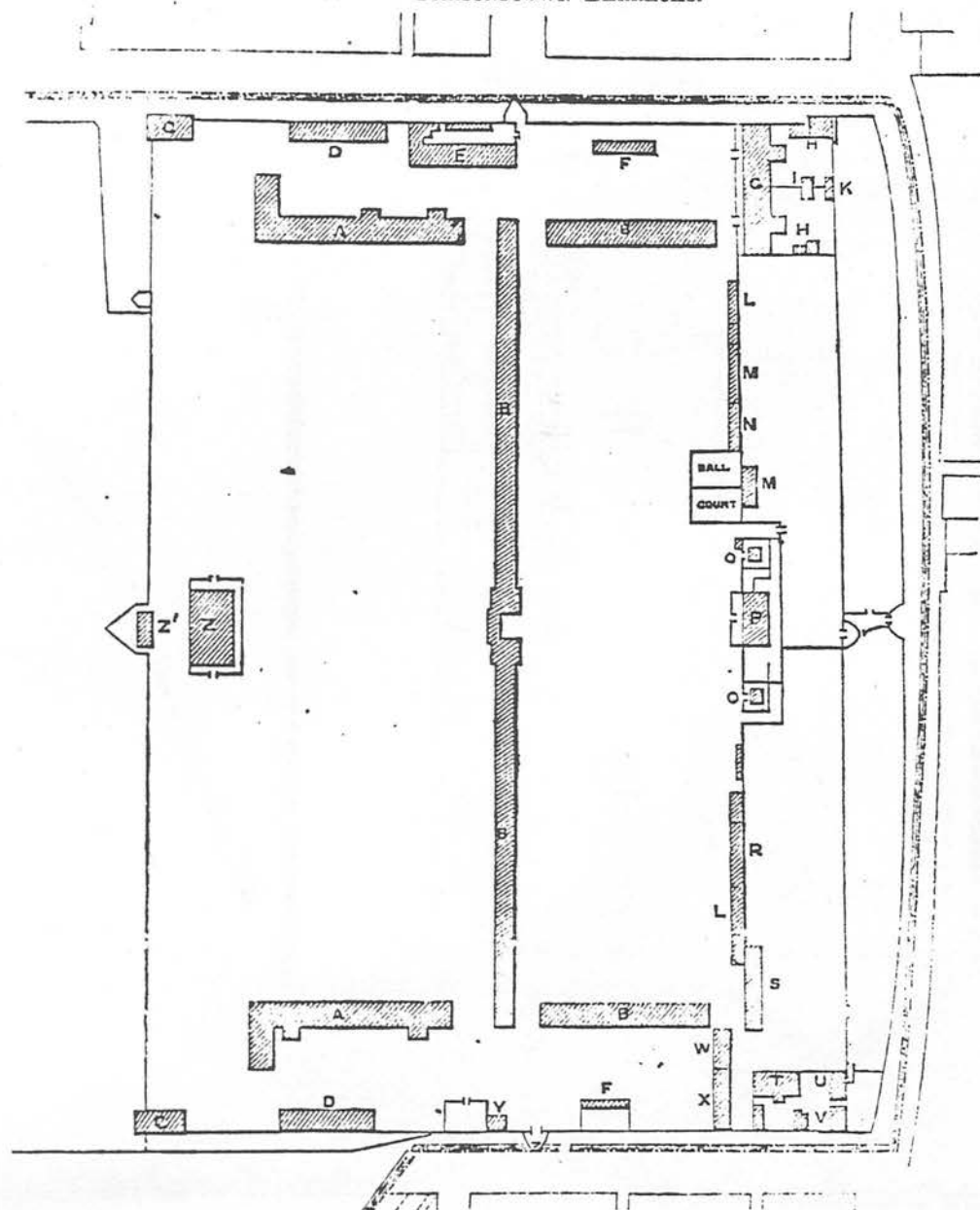
—HULME CAVALRY BARRACKS.



42. Site plan of Hulme Cavalry Barrack, Manchester (19th century).



—PARSONSTOWN BARRACKS.



SCALE 200 FEET—ONE INCH.

0 100 200 300 400 500 600 700 800 900 1000 FEET.

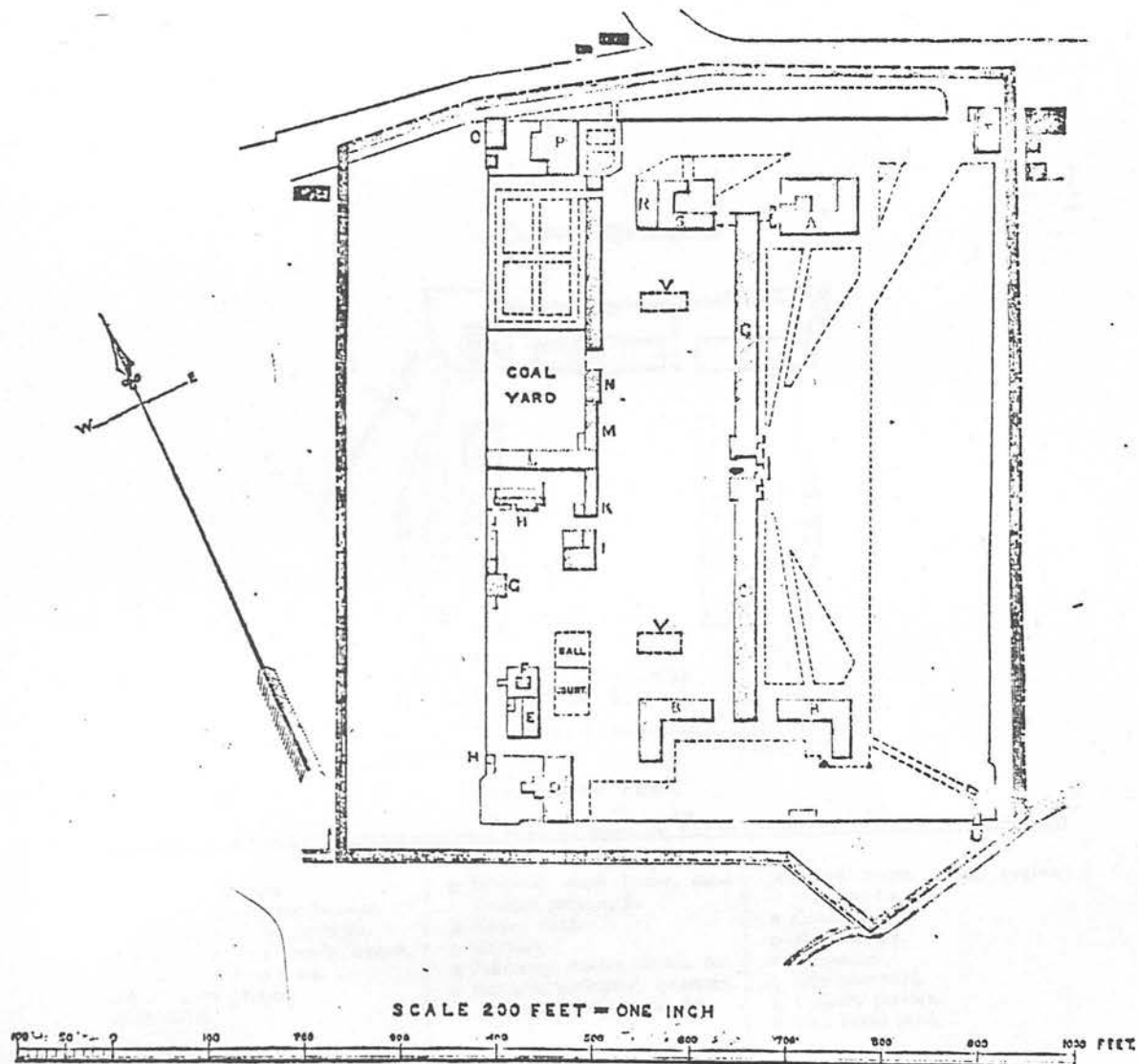
- A Officers' quarters.
- B Soldiers' quarters.
- C Guard houses.
- D Stables.
- E Cancon.
- F Privies.
- G Hospital.
- H Dead houses.
- I Wash house.

- K Privy.
- L Ablution houses.
- M Sheds.
- N Wash house.
- O Magazines 1 and 2.
- P Prison.
- R Engine house, store, and wash house.
- S Barrack stores.

- T Barrack masters' house.
- C Coach house.
- V Stable.
- W Barrack store and office.
- X Straw store.
- Y Armourer's shop.
- Z Chapel school.
- Z' School masters' quarters.

43. Site plan of Parsonstown Barrack, Parsonstown (19th century).

—NAAS BARRACKS.



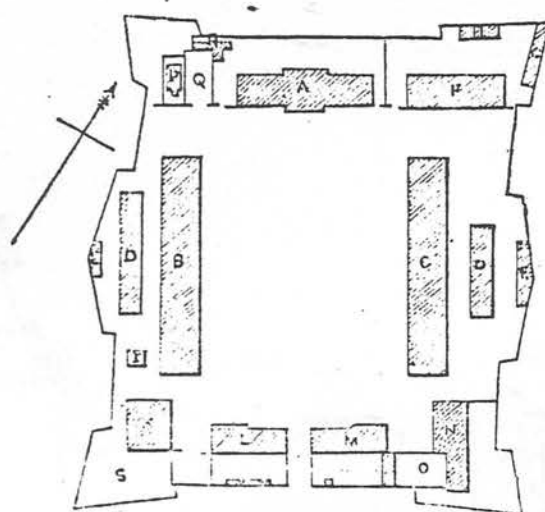
A Officers' quarters and mess.  
 B Officers' quarters.  
 C Soldiers' quarters.  
 D Hospital and dead house.  
 E Prison.  
 F Magazine.  
 G Officers' stables.  
 H Privies.

I Wash house and cookhouses.  
 K Ablution house and store.  
 L Barrack stores.  
 M Engineer store and office.  
 N Store and Engine house.  
 O Commanding officers' stable and coach house.

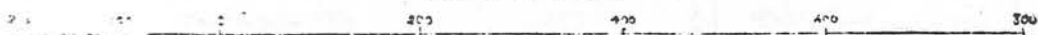
P Officers' quarters.  
 R Barrack and quarter-master-sergeants' quarters.  
 S Canteen.  
 T Orderly and guard room.  
 U Officers' privy.  
 V Fire tanks, 1,200 gallons.

44. Site plan of Naas Barrack, Naas (19th century).

# BURY BARRACKS.



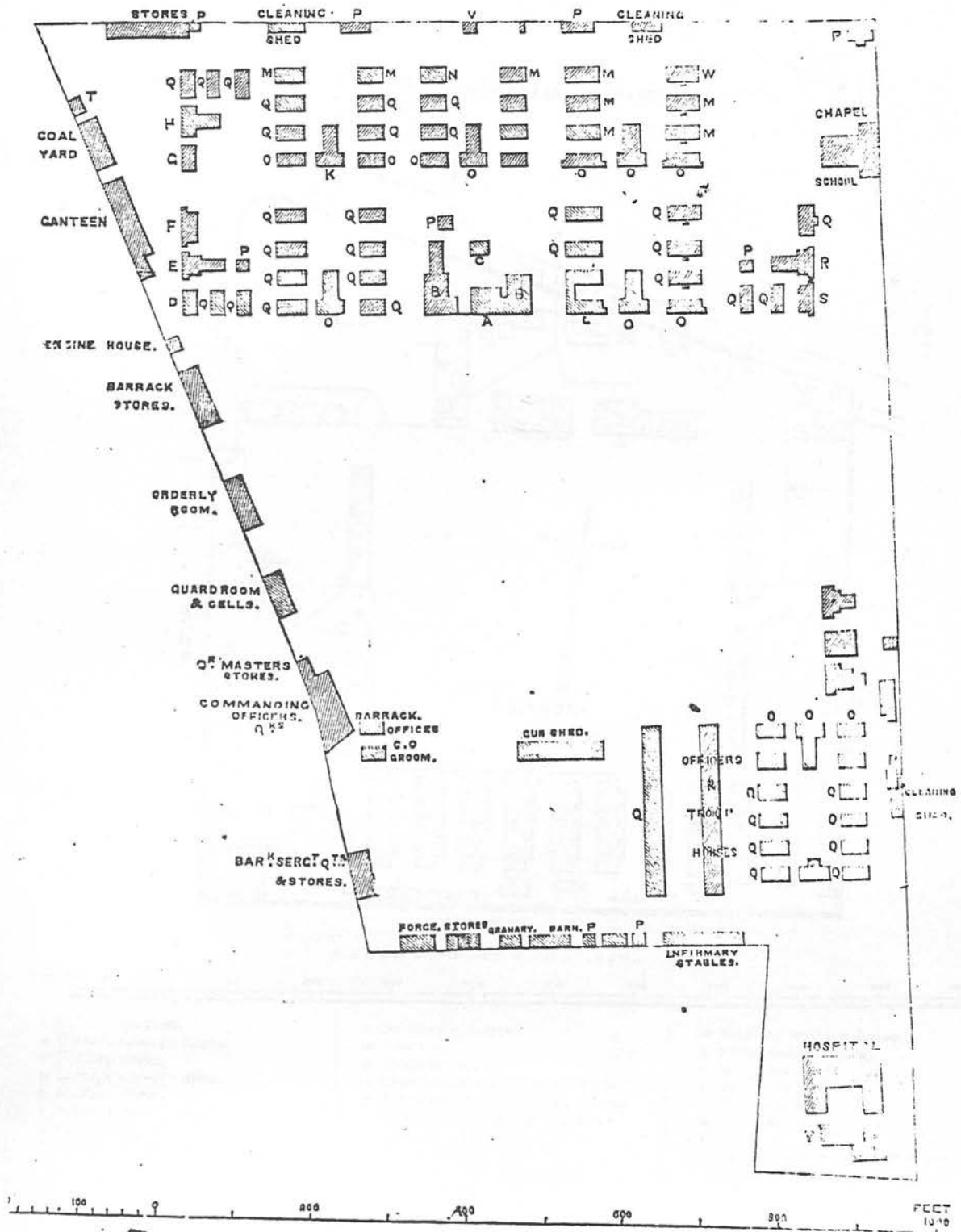
SCALE OF FEET.



- |                                  |  |  |
|----------------------------------|--|--|
| A Officers' quarters.            | G Hospital wash house, dead house, privies, &.           | M Guard room, cells, engine house, &c. |
| B Stables, cavalry rooms over.   | H Airing shed.   | N Canteen.                             |
| C Infantry & Officers' barracks. | I Granary.   | O Five's court.                        |
| DD Cook houses, wash houses, &c. | K Infirmary stables, stores, &c.                         | P Magazine.                            |
| EE Soldiers' privies.            | L Barrack serjeants' quarters, stores, orderly room, &c. | Q Engineer yard.                       |
| F Hospital.                      |  | R Officers' privies.                   |
|                                  |  | S Sick horse yard.                     |

45. Site plan of Bury Barrack, Manchester (19th century).

# CHICHESTER BARRACKS.



- A Officers' mess room.
- B Field officers' quarters.
- C Mess, men's.
- D Serjeant-majors' quarters.
- E Artillery serjeant's quarters and orderly room.
- F Ablution room.
- G Staff serjeants' quarters and orderly room.

- H Staff serjeants' quarters.
- K Library and reading room.
- L Lecture room.
- M Married soldiers' quarters.
- N Cooking kitchen.
- O Officers quarters.
- P Latrines.
- Q Soldiers' quarters.

- R Serjeants' quarters.
- S Barrack master and schoolmaster's quarters.
- T Stables.
- V Armourer's shop.
- W Wash house.
- X Hospital wash house, cook house, store, and dead house.

46. Site plan of Chichester Barrack, Chichester (19th century).

[illegible]

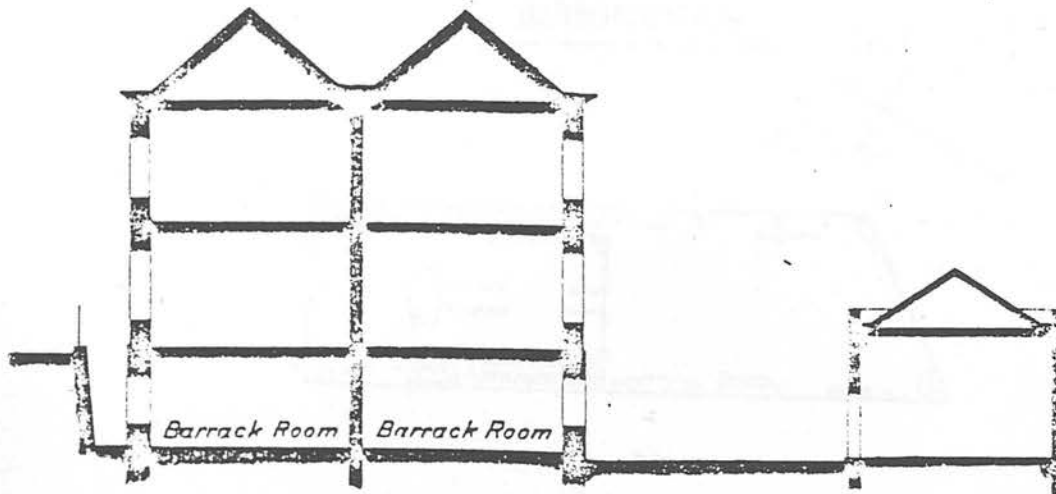
SCALE 200 FEET = ONE INCH.



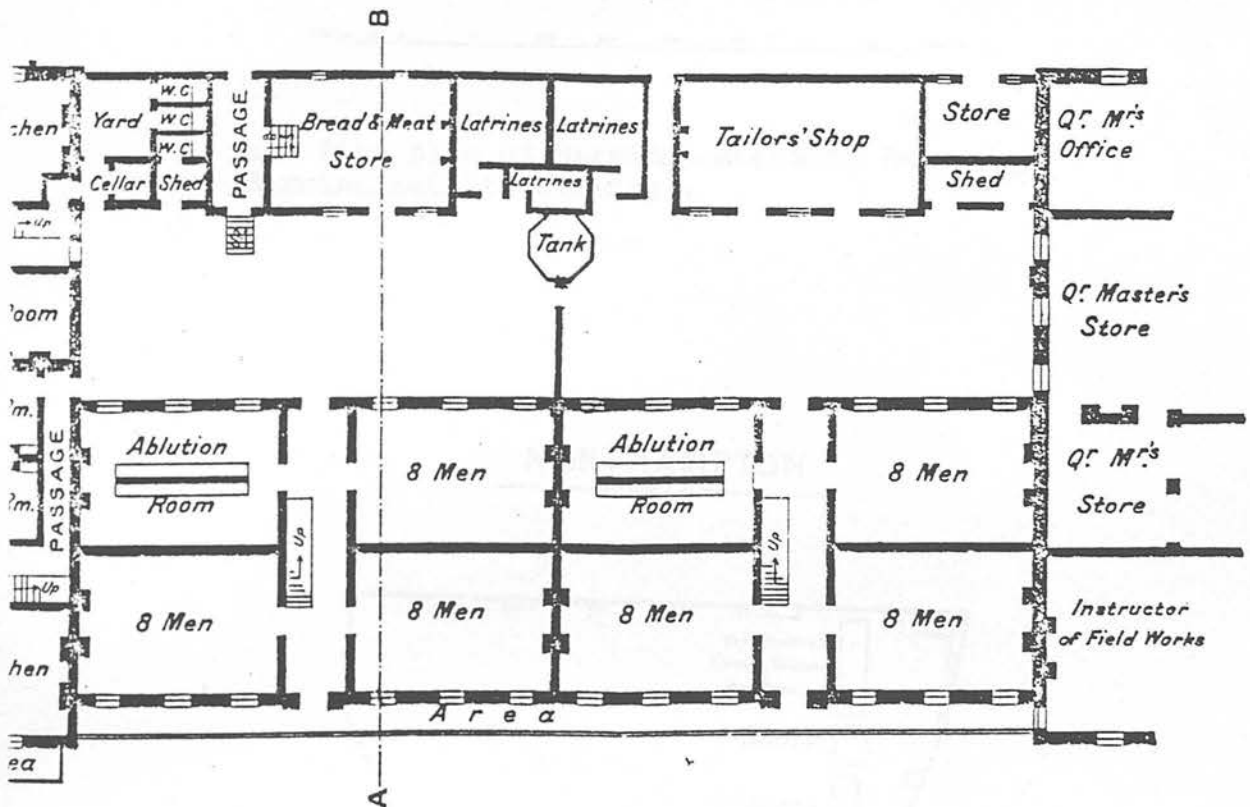
- |                            |                                   |  |
|----------------------------|-----------------------------------|--|
| a Officers' quarters.      | l Soldiers' quarters.             | w Soldiers' washing house.               |
| a Barrack master's house.  | m Ash pit.                        | x Forge and workshop.                    |
| b Bolding store.           | n Soldiers' privies.              | y Magazine.                              |
| c Barrack master's office. | o Cook house and cleaning sheds.  | z Drain pits.                            |
| d Barrack stores.          | p Wash houses and cleaning sheds. | v' Engine house.                         |
| e Store room.              | r Armourer's shop and pharmacy.   | w' Canteen.                              |
| f Officers' privies.       | s Infantry stables.               | x' Cells.                                |
| g Barrack privy.           | t Troop stables.                  | y' Barrack sergeants quarters and cells. |
|                            | u Hay, corn, and straw store.     | z' Guard room and regimental stores.     |
|                            | v Riding school.                  |  |

47. Site plan of Dundalk Barrack, Dundalk (19th century).

# CHATHAM. BROMPTON BARRACKS.



SECTION ON A-B.

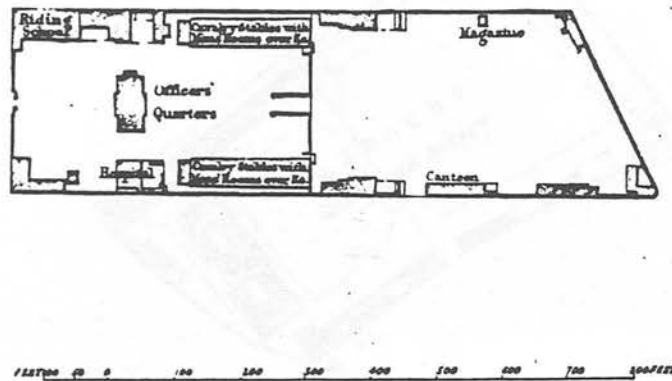


PART PLAN OF BASEMENT.

48. Plan and section of Barrack room block in Brompton Barrack, Chatham (early 19th century).

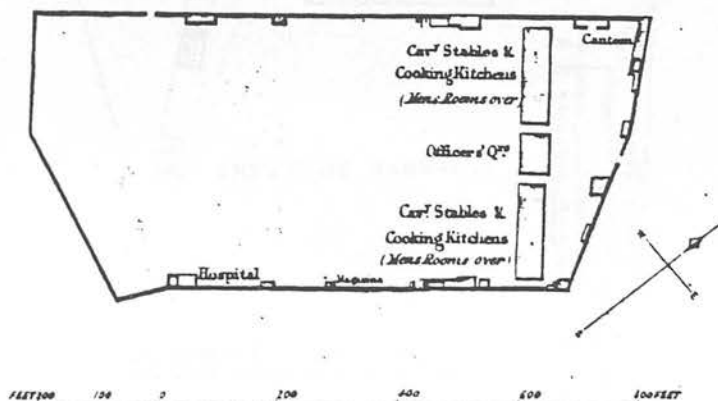


## BIRMINGHAM

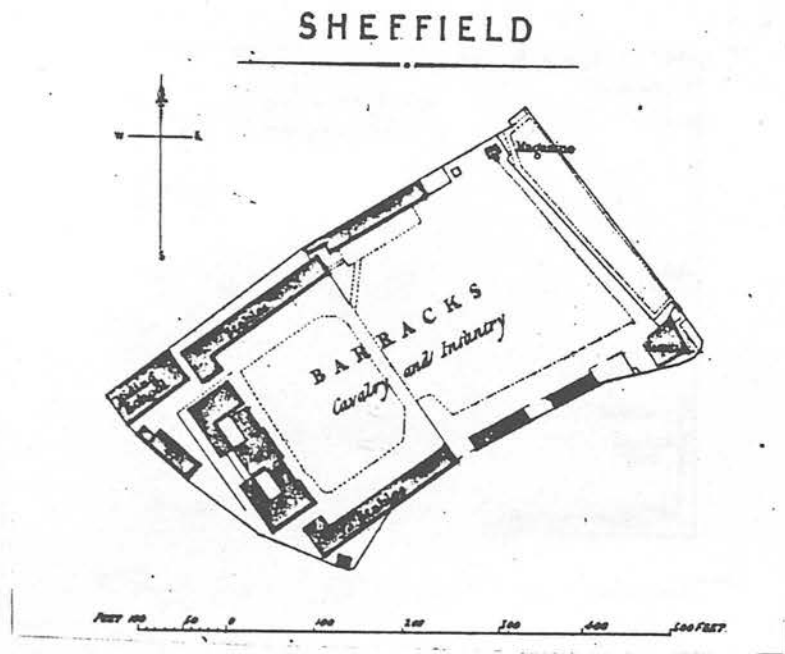


49. Site plan of Birmingham Cavalry Barrack, Birmingham (19th century).

## NORTHAMPTON



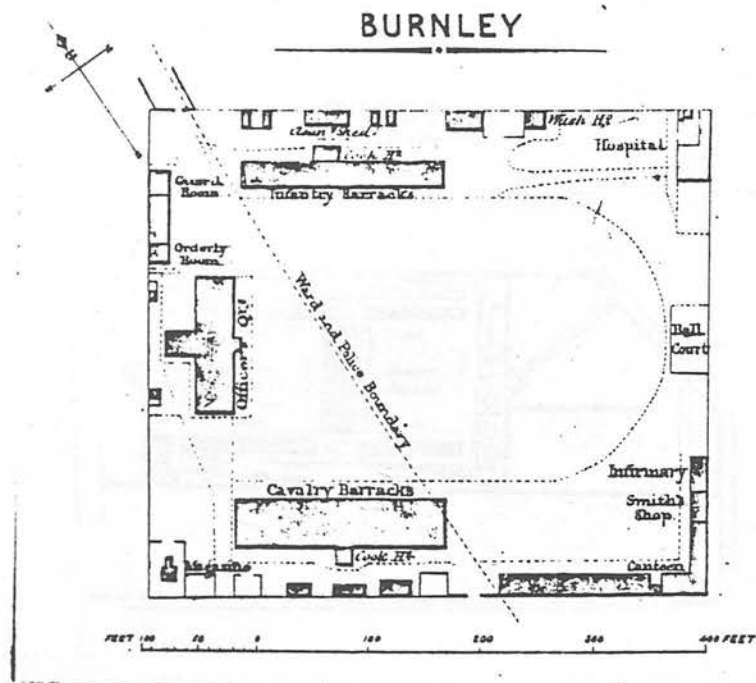
50. Site plan of Northampton Barrack, Northampton (19th century).



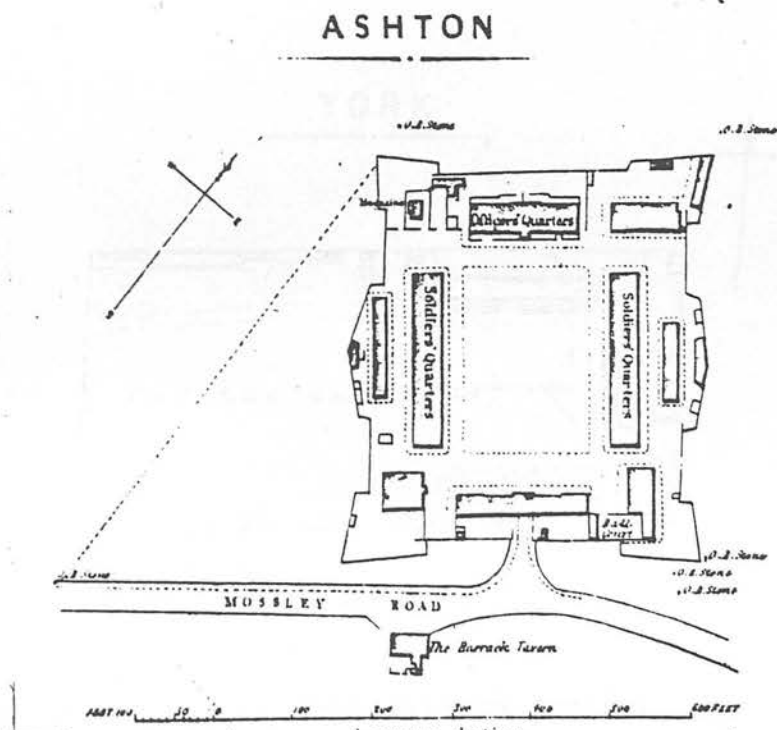
51. Site plan of Sheffield Barrack, Sheffield (19th century).



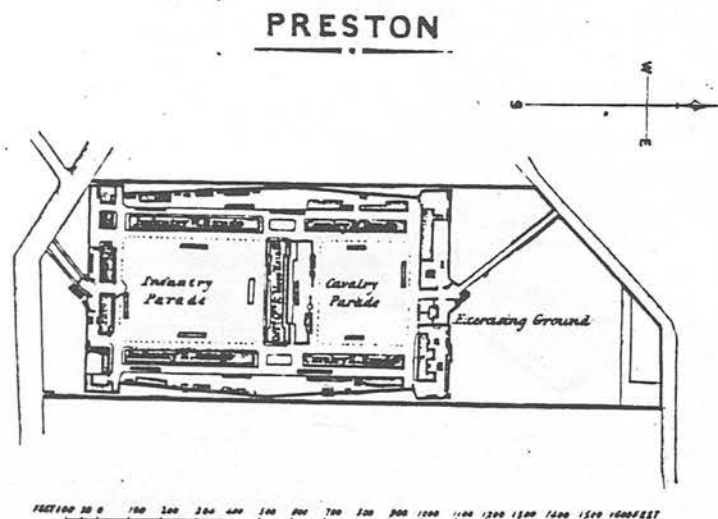
52. Site plan of Salford Barrack, Manchester (19th century).



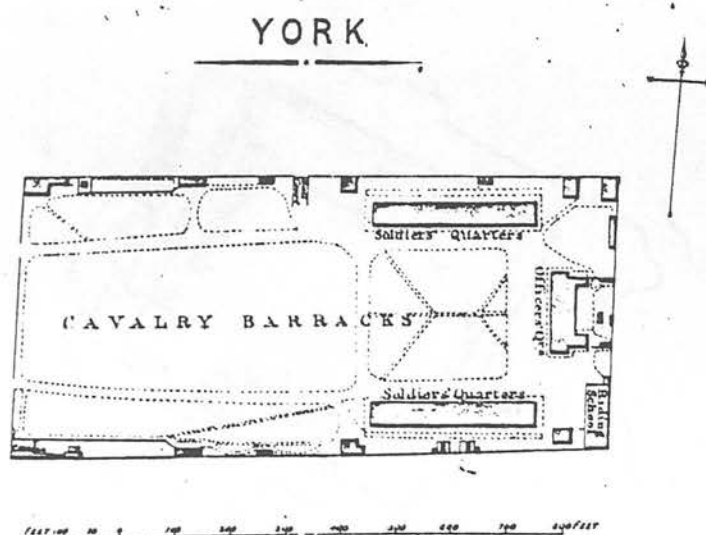
53. Site plan of Burnley Barrack, Burnley (19th century).



54. Site plan of Ashton Barrack, Ashton (19th century).

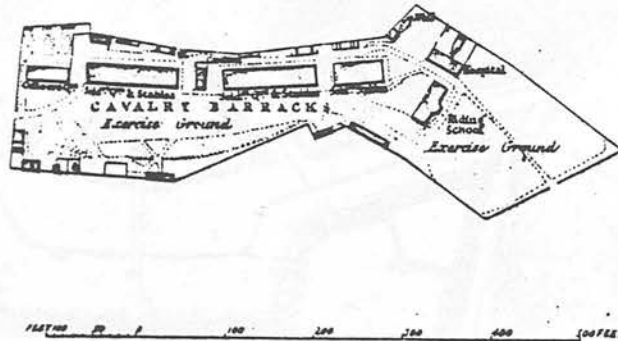


55. Site plan of Fulwood Barrack, Preston (19th century).



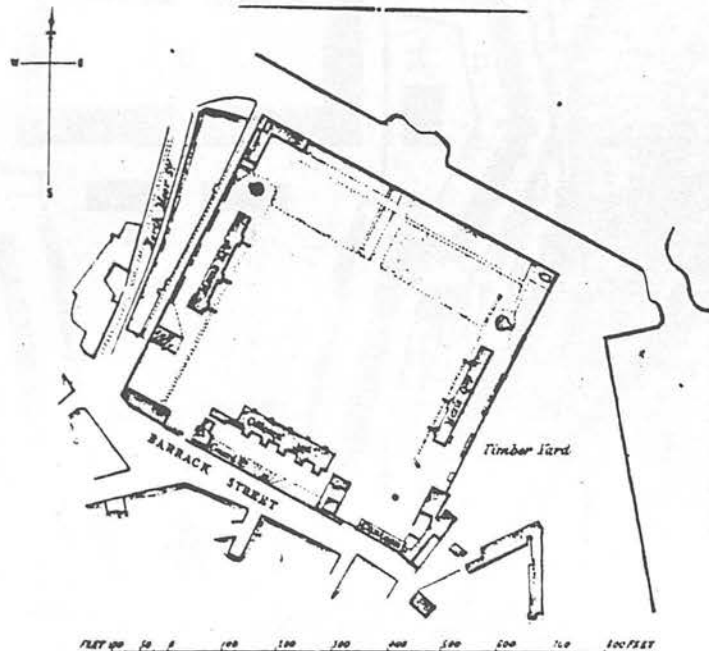
56. Site plan of York Cavalry Barrack, York (19th century).

## LEEDS



57. Site plan of Leeds Cavalry Barrack, Leeds (19th century).

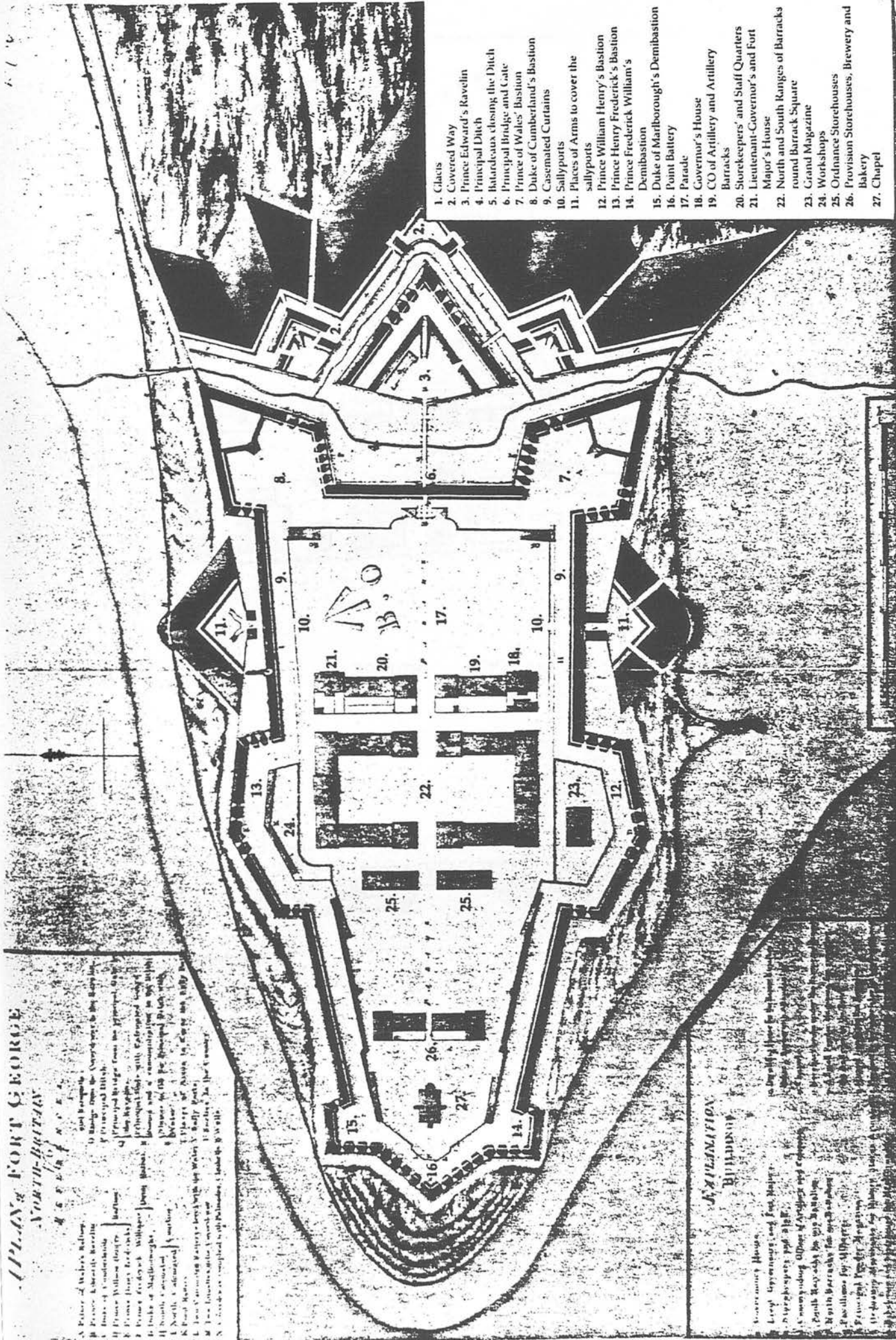
## SUNDERLAND



58. Site plan of Sunderland Barrack, Sunderland (19th century).

# PLAN OF FORT GEORGE NORTH-BRITAIN

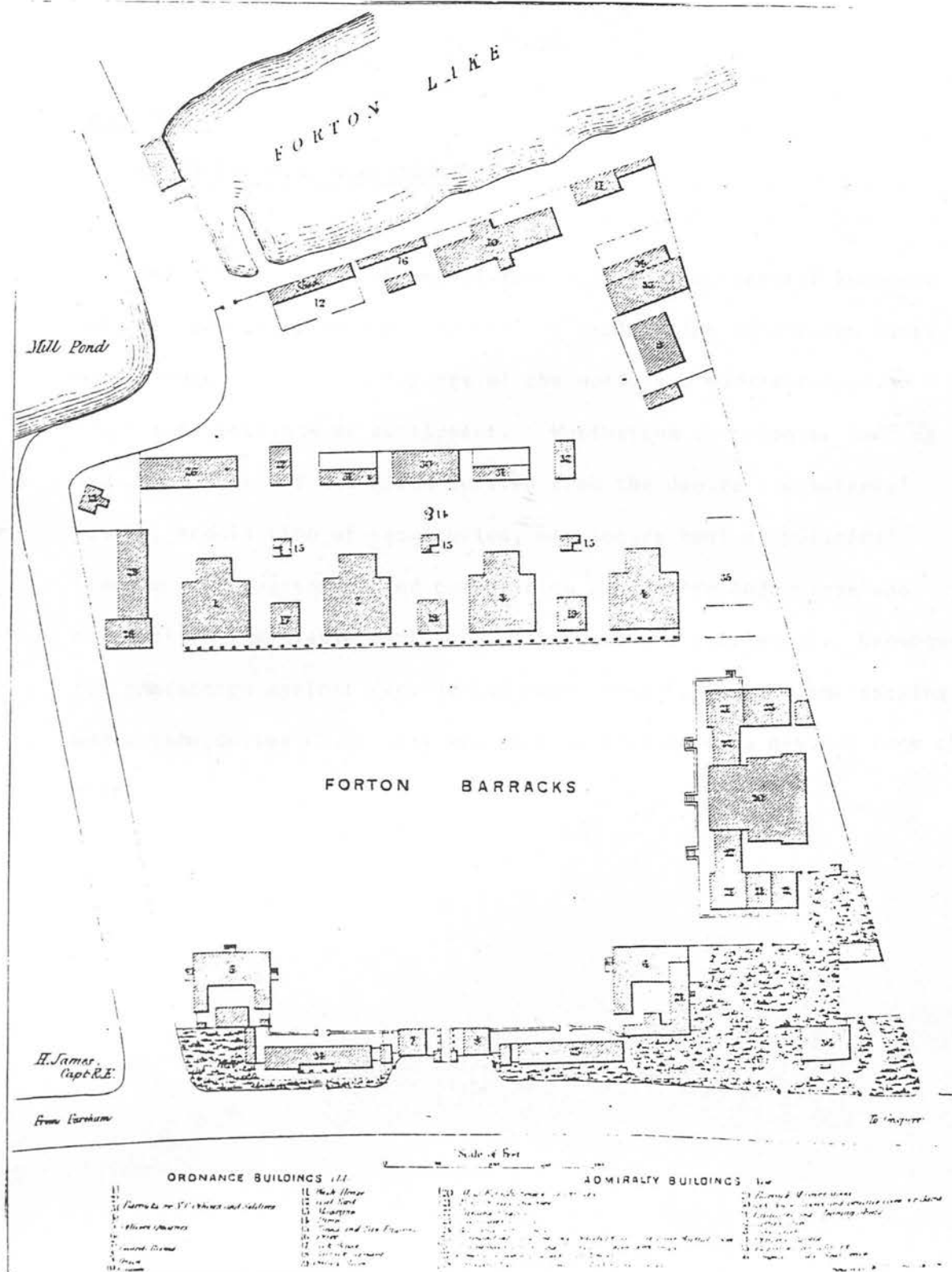
1. Palace of the Duke of Cumberland
2. Prince Edward's Ravelin
3. Prince William Henry's Bastion
4. Prince Frederick's Bastion
5. Prince of Wales' Bastion
6. Duke of Cumberland's Bastion
7. Casemated Curtains
8. Sallyports
9. Places of Arms to cover the sallyports
10. Prince William Henry's Bastion
11. Prince Frederick William's Bastion
12. Duke of Marlborough's Demibastion
13. Point Battery
14. Parade
15. Governor's House
16. CO of Artillery and Artillery Barracks
17. Storekeepers' and Staff Quarters
18. Lieutenant-Governor's and Fort Major's House
19. North and South Ranges of Barracks round Barrack Square
20. Grand Magazine
21. Workshops
22. Ordnance Storehouses
23. Provision Storehouses, Brewery and Bakery
24. Chapel



1. Glacis
2. Covered Way
3. Prince Edward's Ravelin
4. Principal Ditch
5. Batardeaux closing the Ditch
6. Principal Bridge and Gate
7. Prince of Wales' Bastion
8. Duke of Cumberland's Bastion
9. Casemated Curtains
10. Sallyports
11. Places of Arms to cover the sallyports
12. Prince William Henry's Bastion
13. Prince Henry Frederick's Bastion
14. Prince Frederick William's Demibastion
15. Duke of Marlborough's Demibastion
16. Point Battery
17. Parade
18. Governor's House
19. CO of Artillery and Artillery Barracks
20. Storekeepers' and Staff Quarters
21. Lieutenant-Governor's and Fort Major's House
22. North and South Ranges of Barracks round Barrack Square
23. Grand Magazine
24. Workshops
25. Ordnance Storehouses
26. Provision Storehouses, Brewery and Bakery
27. Chapel

59. Site plan of Fort George, Inverness (1769).





60. Site plan of Forton Barrack, Forton (19th century).

## CHAPTER TWO

### OTHER COLONIAL TERRITORIES

During the fifteenth and sixteenth centuries, several European Nations, awakening to the potential of exploration in unknown lands, made voyages to different parts of the world and made attempts to claim some sections by settlement. Motivation to colonise America and other parts of the world derived from the desire for material profit, acquisition of territories, missionary zeal or political freedom. Disagreement and competition over these objectives made conflict an inevitable part of colonial life and settlement. Consequently, for protection against natives and from other Europeans, the raising and accommodation of an army was an essential defence measure from the start.

## AMERICA

The colonization of North America by European Nations started in the mid-sixteenth century. Consequently, fortifications had to be built and postioned to control harbours and natural interior highways. The early forts built were the square, four bastioned plan widely known in Europe, brought across by the French, Spaniard and English settlers. The earliest structures were small and were built of timber which easily decayed. As the competition for the continent intensified, fortifications became larger and more formidable.

After the War of Independence<sup>1</sup>, the American army was engaged in the defence of both its land and sea frontiers. The sea frontiers had permanent fortifications similar in style to those of the French school. These fortifications, however, were recognised to be more elaborate than what was required inland against the Indians who were not ready to besiege a fortified place. The land frontier forts thus became bases from which the Indians were pursued and the defence of the forts became simplified.

The layout of most American forts bear resemblance to those of the British Barracks of the same period. The buildings were generally arranged around a broad rectangular parade ground, typical military hierarchy being observed in the positioning of the buildings. Officers' quarters occupied the south-east side of the quadrangle, with the Barrack room blocks on the opposite side. On the north-east, in between the officers' and enlisted men's quarters, were the stables.

1. The eighteenth century struggle by 13 American colonies to gain independence from Great Britain, culminating in victory through the War of Independence (1775-83) and in the formation of United States of America (American Revolution).

The fourth side of the parade had the offices and hospital. Service buildings were located behind the structures they served. Method and techniques of construction was, however, different from those used by the British. When the American soldiers moved into unfamiliar but previously inhabited areas, they for convenience adopted building techniques that were indigenous to the area, if those techniques were applicable to their needs. When local civilian workers were hired, they therefore worked with a familiar type of construction.<sup>2</sup>

The following examples will help to illustrate the layout of the American forts of this period.

a. Fort Fayette, Pennsylvania (1792) - Fig.61)

Fort Fayette was a square, four bastioned fort with an ~~enceinte~~<sup>enceinte</sup> of twelve-foot high stockading. The buildings within the ~~enceinte~~<sup>enceinte</sup> were neatly located around a parade ground and were set parallel to the curtains. In three bastions, were two storey-block houses with cannons on the second floor which could fire over the stockade, and in the fourth bastion was a bombproof magazine.

Barrackrooms for 200 men were in two blocks located on two sides of the parade. Each of these blocks had two external stairs which led to an open verandah on the upper floor. The officers' quarters were built as flats with two bedrooms, a kitchen and a sitting room. These flats were located in a block at the Salliport side of the fort. The guardhouse and the hospital formed part of the lower floor of this block. The quartermaster and ordinance stores were located in a block near the entrance gate.

2. Charles Morse Stotz, Drums in the Forest  
(Pittsburgh, Pittsburgh Press, 1958) pp 185-86.

b. Fort Worth, Texas (1849)

This was a nineteenth century unfortified fort established by Major Ripley Arnold. The buildings were also arranged around a rectangular parade in like manner. (Fig.62)

c. Fort Defiance, Arizona (1851)

Described in 1853 as "the most beautiful and interesting post as a whole in New Mexico"<sup>3</sup>, fort Defiance was authorised for the purpose of controlling the warlike Navajo Indians. Many of the structures at Defiance were constructed from earth and wood<sup>2</sup>. The walls of most constructed simply of pine logs laid up horizontally. This form of building was developed in response to the climate. Since this was an arid region, there was little need for pitched roofs which could shed rain or snow. Therefore, undressed logs simply spanned from wall to wall, supporting a flat dirt roof. Earth proved a good insulator against both cold and heat, although it would normally leak during heavy rains. (Fig.63)

d. Fort Simcoe, Washington (1856)

The fort was established by Major Robert Seldon. Conditions that motivated the site selection and building organisation on the site were the same as those that prevailed in other locations during the same period. (Fig.64)

e. Fort Summer, New Mexico (1862)

The arrangement of the buildings and the zoning of the site into distinct functional groups of buildings respected American Military tradition of the period.

3. R.W.Frazer, Manfield on the Condition of the western forts 1853-54, (Oklahoma: Norman, 1963) p.21.

However, the integration of courts into the scheme could be seen as an adaptation of Spanish architecture, with one exception to the north, the barrack room blocks were oriented around enclosed courts; those of the officers were positioned to create courts open in the direction of the parade. The hospital, quartermaster yard and the Commissary had courtyards. (fig.65).

f. Fort Phil Kearney, Wyoming (1866)(Fig.66)

The buildings in this fort were constructed by soldiers, using pine and earth which were got within 8 kilometres with considerable ease. The walls were built with tenon and groove joints because this was considered to have provided rapidity of erection, neatness and tightness.(Fig.67) The Barrack room blocks consisted of a dormitory (7.3m x 22.9m) for 100 men, one store (3.7m x 3.7m), a sergeant's room (3.7m x 3.7m) , a wash and mess room (7.3m x 7.3m) and a kitchen (3.7m x 7.3m). A verandah runs the whole length of the block. (Fig.68).

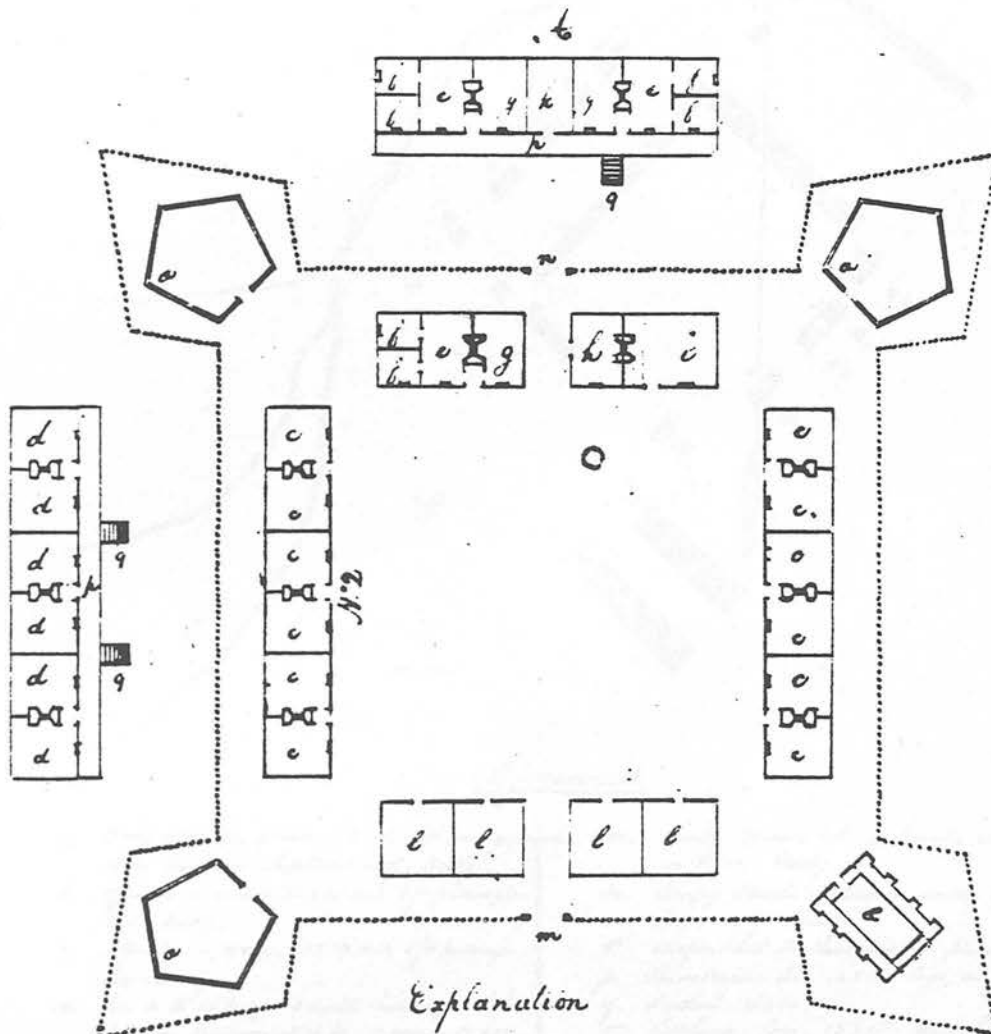
g. Fort Laramie, Wyoming (1849)

Fort Laramie was located on a site adjacent to the Laramie river. While conforming to general military layout of the period, the plan of the fort was adjusted to topography. The site provided three levels; on the highest level was the cemetery; the intermediate area was given to buildings which housed regular military functions; the lowest level was occupied by service facilities. (Fig.69).





Scale - 40 Feet to an Inch

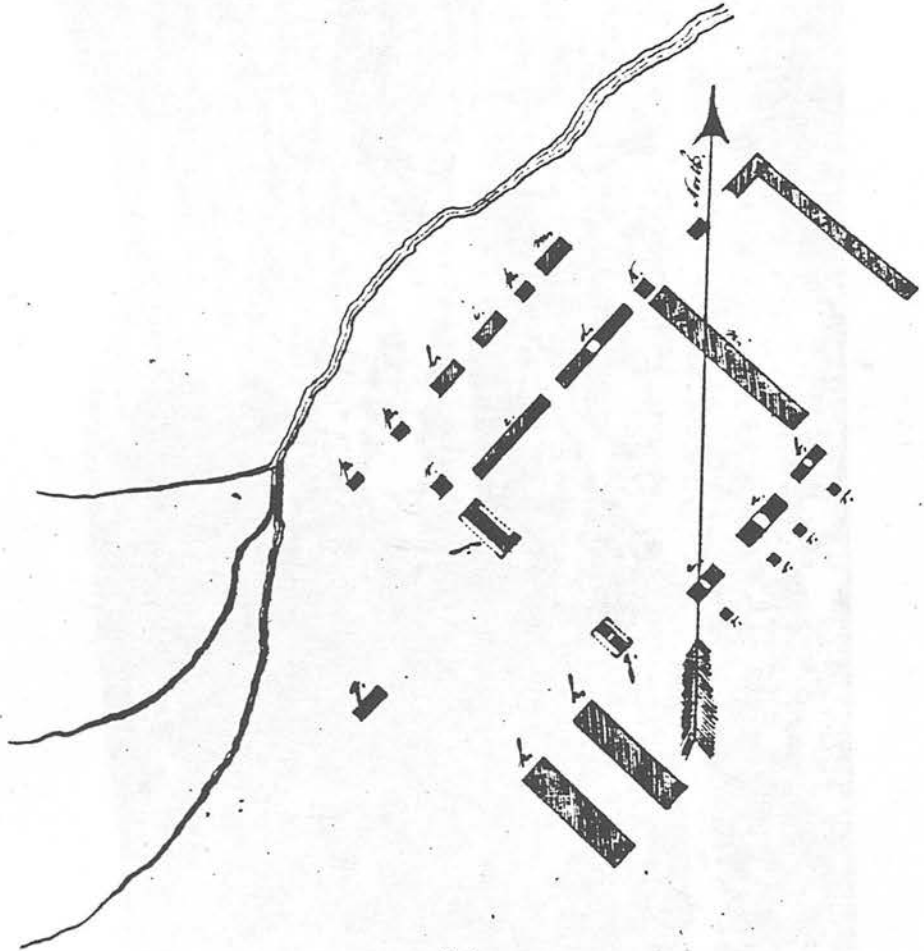


### Explanation

- |   |  |
|---|--|
| a Pentagon Block House & powder Mounted             | e Quarters, Masters & Capt. Stone Houses |
| " in second story of each to fire over the picquets | m Gate                                   |
| b Magazine of Stone or Brick - Dome Roof            | n Salt vat                               |
| cccs. First } Story of Barracks for 200. Men        | o Well                                   |
| ddd & second }                                      | e to second story. Officers Quarters     |
| eee. Officers Quarters                              | p Galleries                              |
| fff. Bed Rooms                                      | g Stairs to Gallery                      |
| ggg. Stables  | ..... Stockade 12 Feet high              |
| h Guard House                                       | Strong & pointed.                        |
| i Hospital  | 8 Fire pieces                            |
| k Ammunition Store Room                             |  |

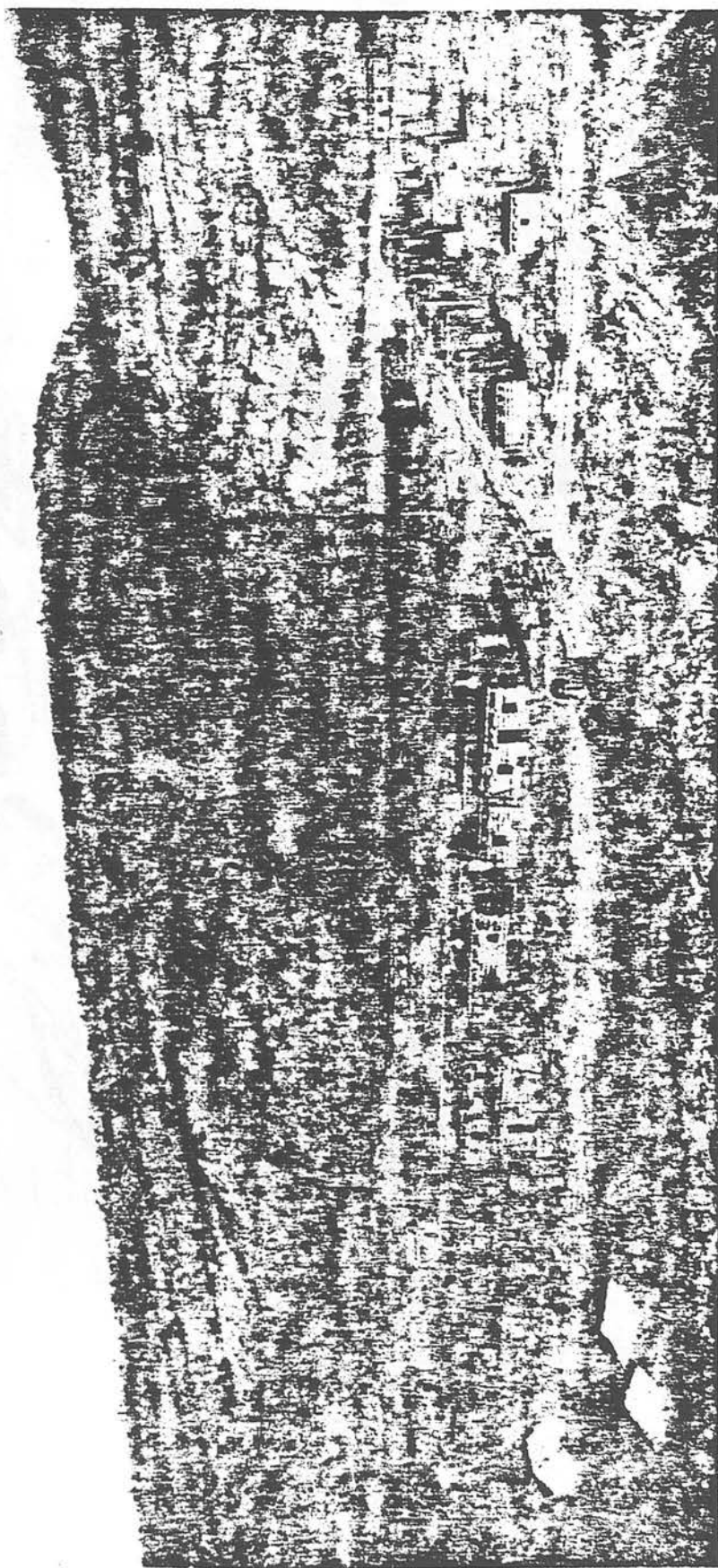
61. Plan of Fort Fayette, Pennsylvania (1792).

Fig. 9. Rough plan of Fort Worth, Texas.

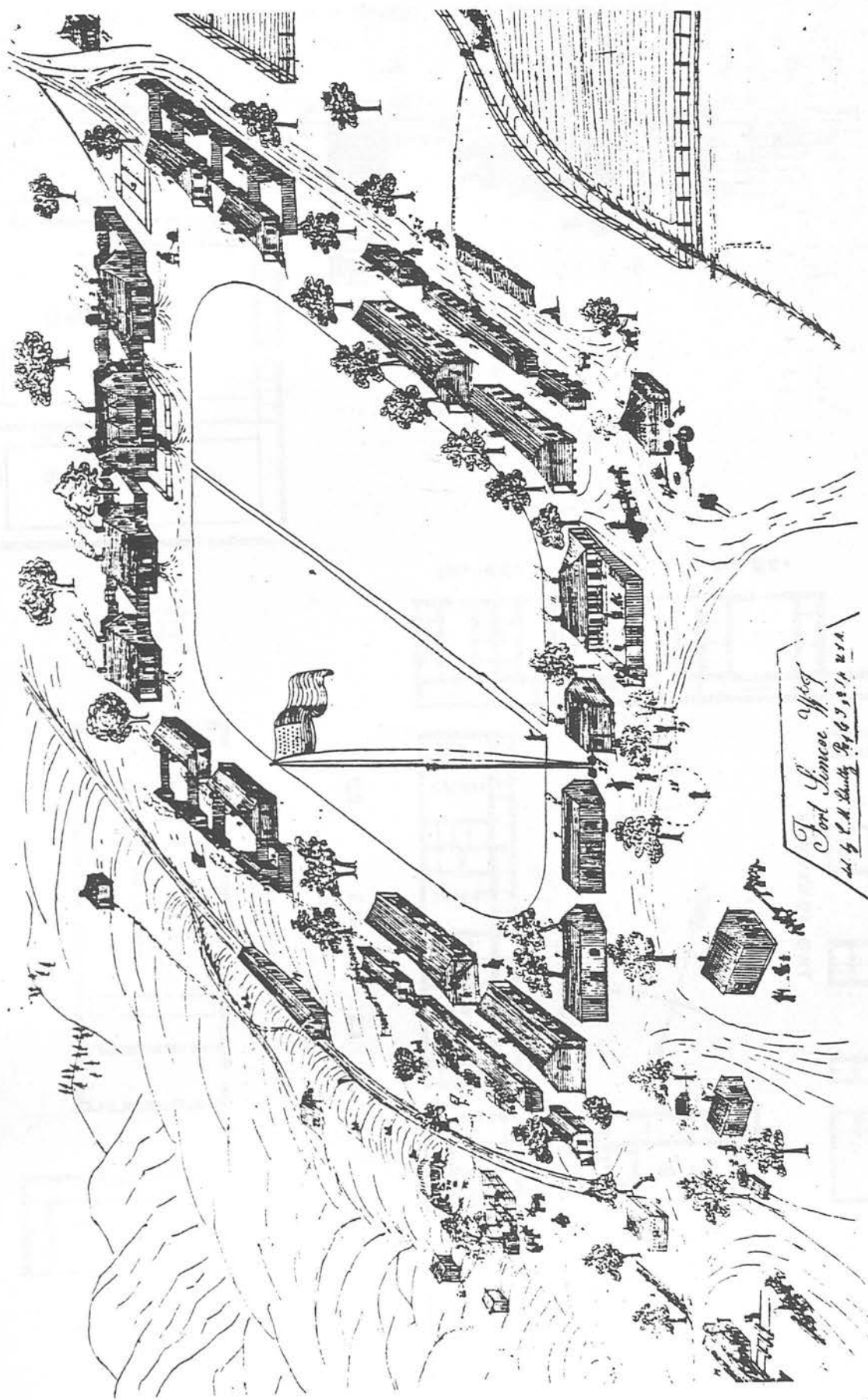


References.

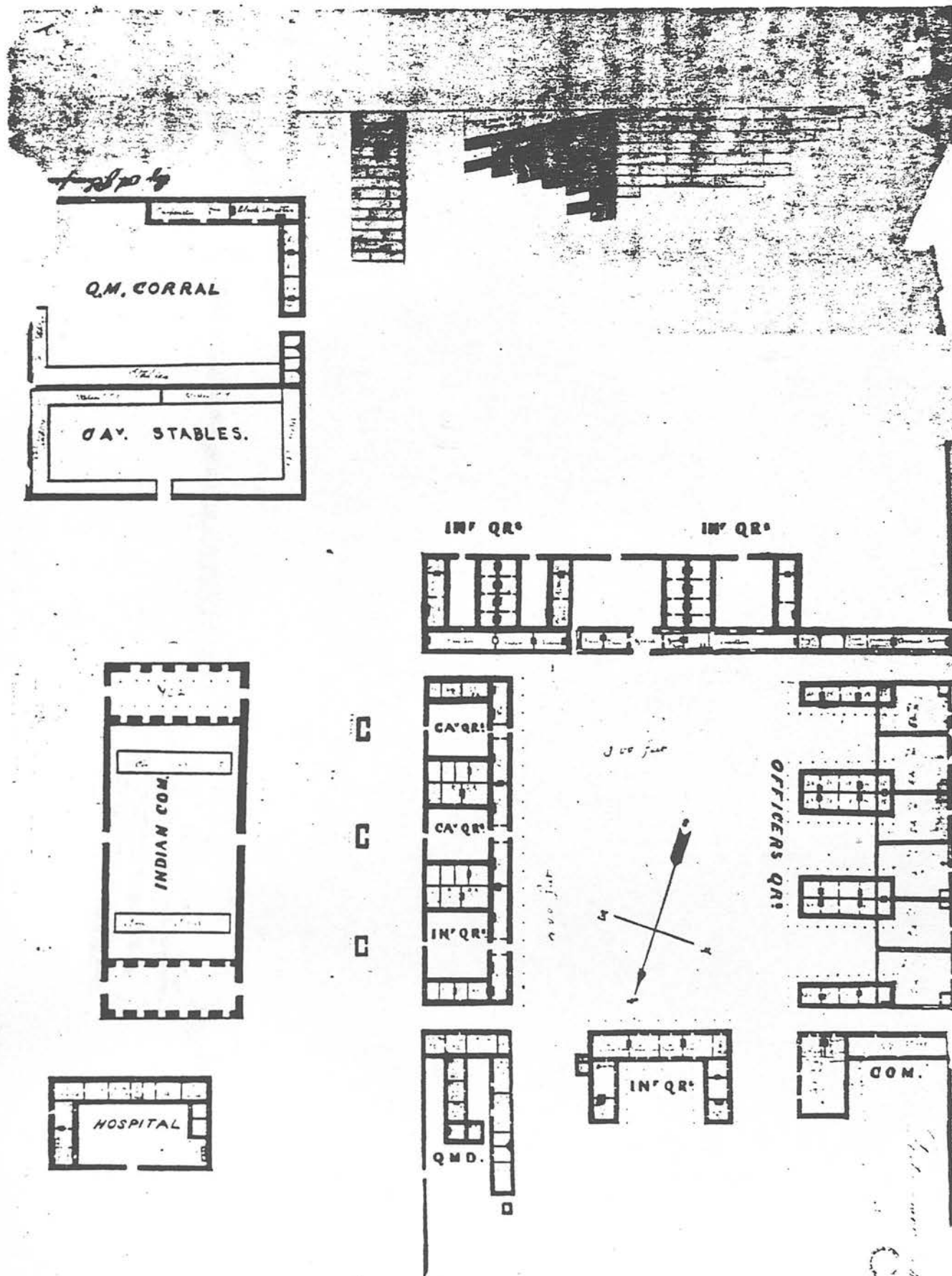
- |   |   |
|---|---|
| a. Comd'g Offr's Qu. 2 rooms 18x18, with passage, 15 ft. heavy logs - clapboard roof - leaky.                     | m. Compy mess Shed - palisade work, 30x15, no floor, leaky.     |
| b. Offr's Qu. 2 rooms, 15x15, with 8 ft passage - logs - leaky.   | n. Compy stable - palisade work, 150x30, clapboard roof, leaky. |
| c. Offr's Qu. 2 rooms, 14x14, with 8 ft passage, logs - leaky.  | o. Washin'gton St. Mrs's stable - palisade work.                |
| d. Qu. Co. B 25 Drago. - 2 double buildings with passage between of 12 ft. - 4 rooms 17x17, old & leaky.          | p. Quartermaster's Qu. 12x15, logs, no floor, leaky.            |
| e. Unoccupied Compy Qu. - palisade work - logs - leaky & no floor.  | q. Sudder's store.  |
| f. Hospital - body of building 34x17 - 2 corner rooms 10x10 - frames - board floor - clapboard roof - 2 passages. | r. Kitchens - logs, 15x15 - puncheon floors - leaky.            |
| g. Adjutant's Office - frames - 2 rooms 11x11 with passage of 7 ft. - 2 leaky passages.                           |   |
| h. Two commissary's storerooms, 90x31, logs, no floor, clapboard roof.  |   |
| i. Dr. Mr's store room, 30x15 - logs, no floor, leaky.  |   |
| k. Guest house - logs - without floor, 12x12.   |   |
| l. Warehouse, logs, 15x20, leaky.   |   |



63. Fort Defiance, Arizona (1851).

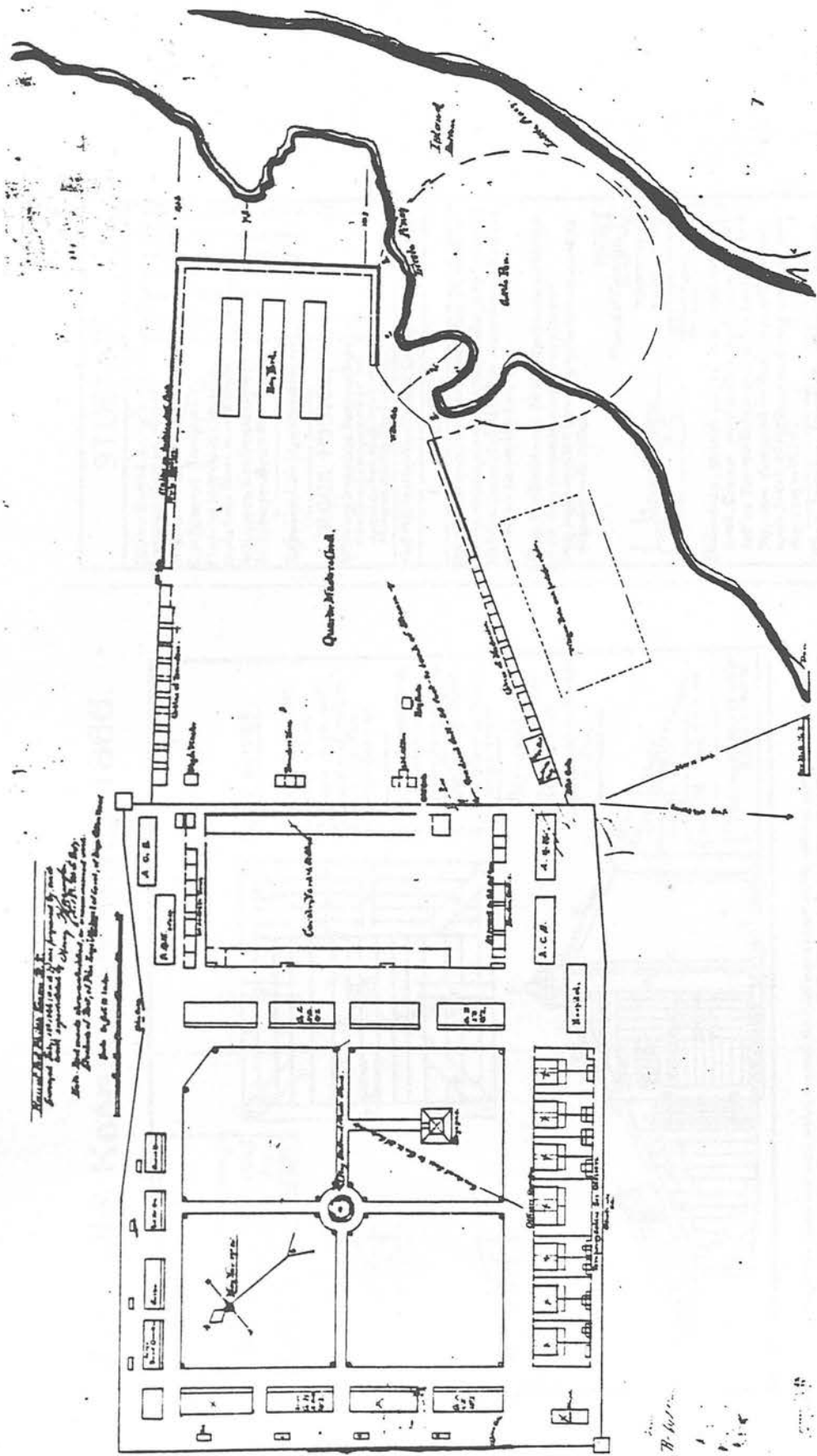


64. Fort Simcoe, Washington (1856).



65. Plan of Fort Sumner, New Mexico (1862)

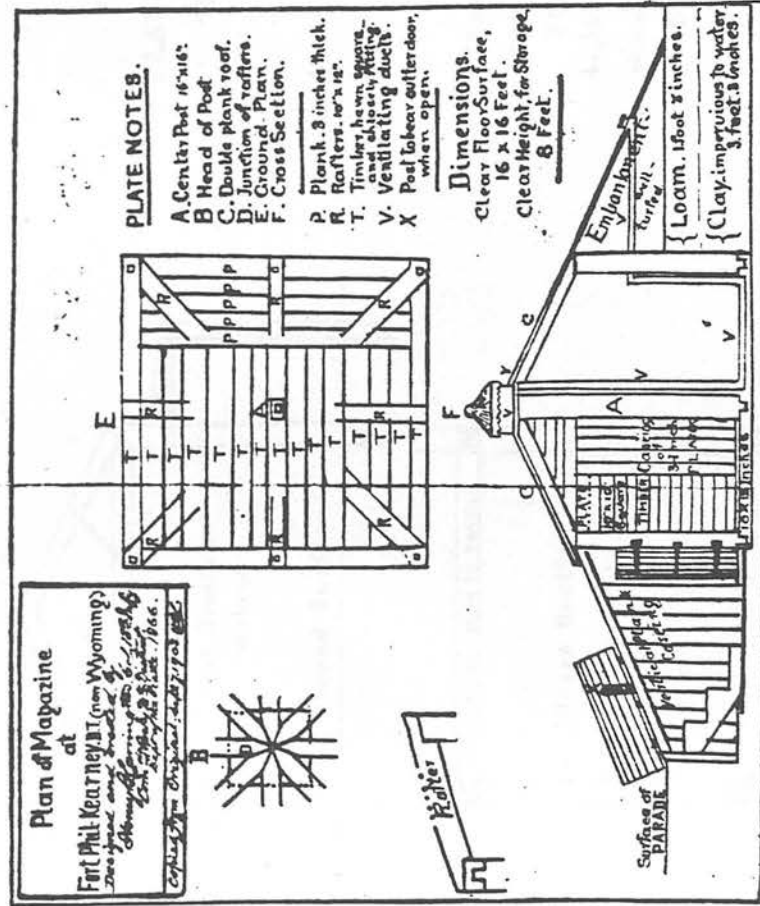




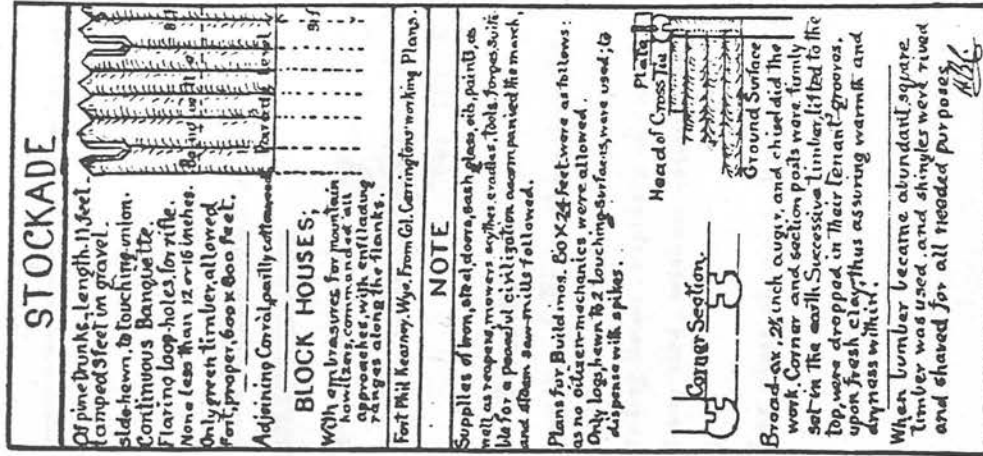
66. Fort Phil Kearny, Wyoming (1866).



# Fort Phil Kearney, Wyoming, 1866.



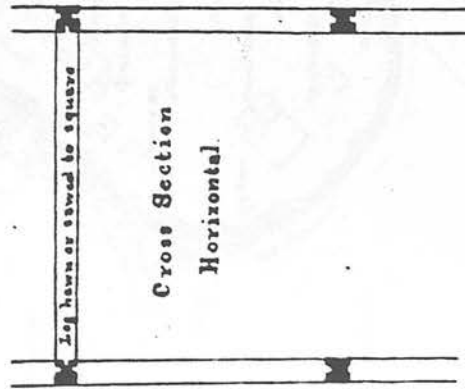
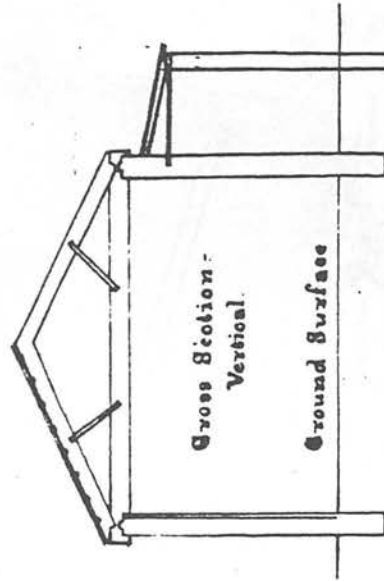
NOTE.—One of two steam saw mills which reached the Post was without safety valve or governor, and these had to be fabricated from materials in the Quartermaster's stock. Daily invoices were delivered to the Quartermaster by the District Commander, of sizes of trees to be cut and hauled, and the amount and dimensions needed for the work as it progressed. Each building had its working drawings thus supplied, and daily inspection was made of the work before the next trip to the Planery was started. The framing of permanent buildings was also carefully laid out when commenced, and closely followed up to completion by the District Commander in person.





Ground Plan

Stoves 10 x 12	Dormitory 24 x 15	Wash & Men Room 8 x 8 1/2	Kitchen 12 x 8 1/2
Loghouse 12 x 10			
Porch			



# PLANS FOR LOG BUILDINGS AT 'FORT PHILIP KEARNEY

Designed and Prepared by  
*Henry H. Huntington*  
Col. 18th U. S. Infantry

## Remarks.

Exhaustless supplies of Pine abound within 5 miles, accessible with ease.

Plan gives to Log House, rapidity of erection, neatness, tightness, and any size, without notching or partitions, when desired.

Same timber gives shingles, by use of axes with great ease.



## WEST INDIES

A group of tropical islands <sup>4</sup> in the west Indies became British Colonies in the seventeenth and eighteenth centuries. Regiments were subsequently raised and Barracks built to accommodate the troops there. In tropical climates generally, and more particularly in the West Indies, the extreme heat and moisture and the sudden alteration of calm weather and hurricanes, were particularly relevant circumstances in the design and construction of dwelling houses. unfortunately, this was not taken cognisance of during the design and construction of the early Barrack blocks here and consequently high mortality rates were recorded amongst the troops.<sup>5</sup>

The soldier in warm climates passed a large portion of his time in his Barrack; and the proper design of them, with a view at least to his health and comfort, must have been a matter of great importance. The usual construction for a Barrack block in the West Indies was a building of wood or stone, wholly or partially surrounded by open verandahs and with shutters of wood or jalousies for the window openings. The interior space gave only 4.25 - 8.5 cubic metres per man. The buildings were exposed to the harmful miasma and suffered injuries from hurricanes.

4. These islands include Bahamas, Barbados, Grenada, Jamaica Trinidad & Tobago, Virgin Island, Antigua and Dominica.

5. Capt. J. Smith R.E. Paper XVIII in Professional papers of the Corps of Royal Engineers. Vol. II was put as 21% in 1825, 18½% in 1826, 25% in 1827, 22% in 1828 and 17% in 1829.

In later Barrack blocks, interior space was increased to between 8.5 - 14.1 cubic metres per man and they had inner and outer walls. The outer wall enclosed a verandah 3 - 3.3m wide between it and the main wall, and had openings on the sides and the gabled ends. The main wall was 2.1 - 2.4 m high, with space between it and the floor above or the ceiling (fig.72). This was found to be less liable to hurricane damage than the open verandah blocks. However, some blocks with open verandah based on Smith's design were still built.<sup>6</sup> The Barrack block (Fig.73), average width 6.4m consisted of a basement, one or two floors with open verandah. It had walls and piers of brick or stone; the doors, jalousies, girders, joists and columns of cast iron, the roof of hard wood. The lengths of the floor was divided into rooms to accommodate eighteen or twenty men each and the upper parts of the partition were jalousies. Two examples are taken to illustrate these points further.

a. Lucea Barrack, Jamaica (1820)

The Barrack room blocks in this Barrack had an enclosed verandah. The external walls were of brick and partitions of wood formed the walls of the rooms (Fig.72). The partitions were carried up to a certain height and space was left between it and the roof for the circulation of air. Two external staircases lead up to the verandah on the upper floor. The external walls had openings covered with jalousies.

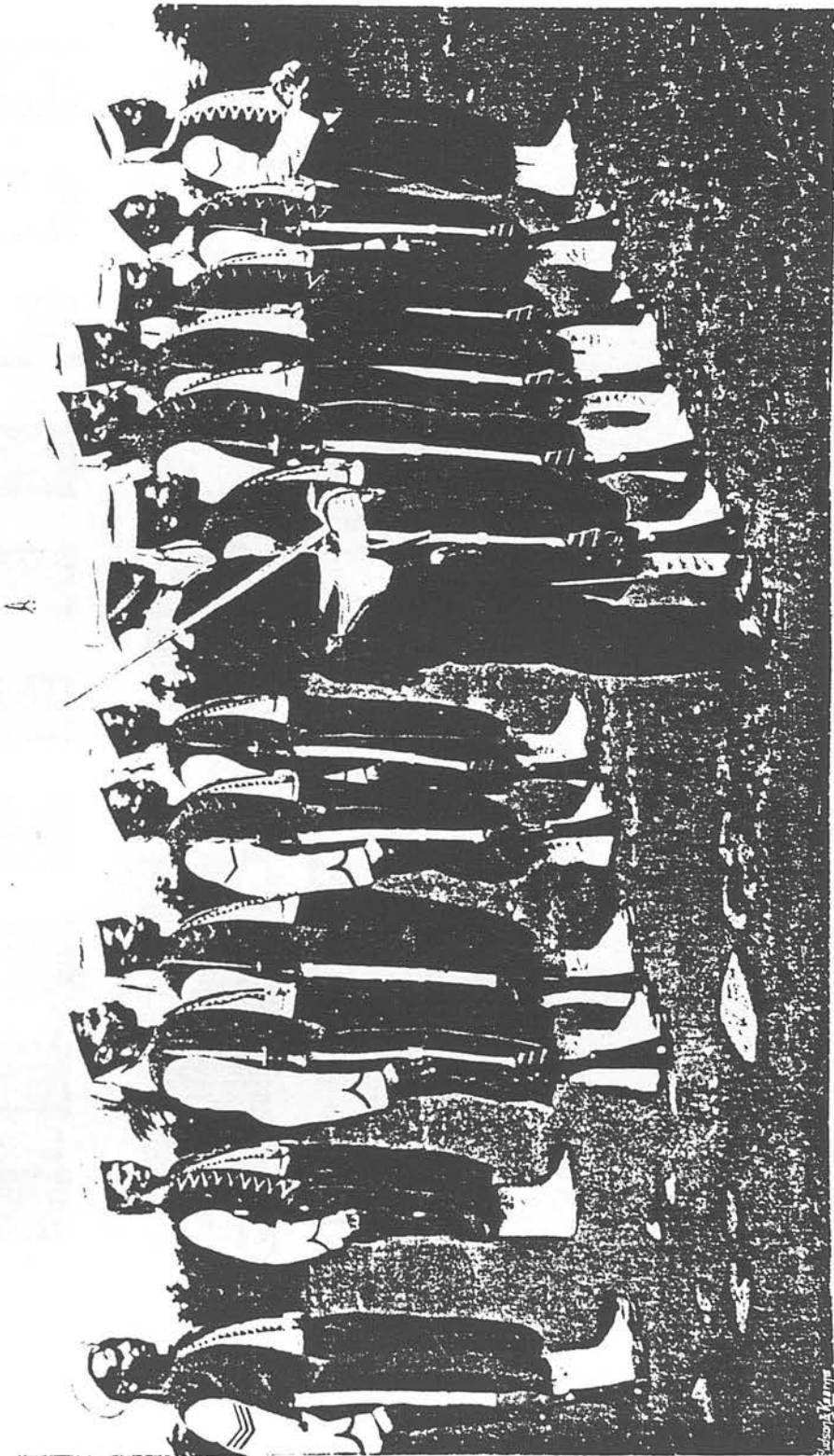
b. Officers' Quarters, Demerara

The officers' block had two floors built of hardwood frame on pillars 2.4m high.

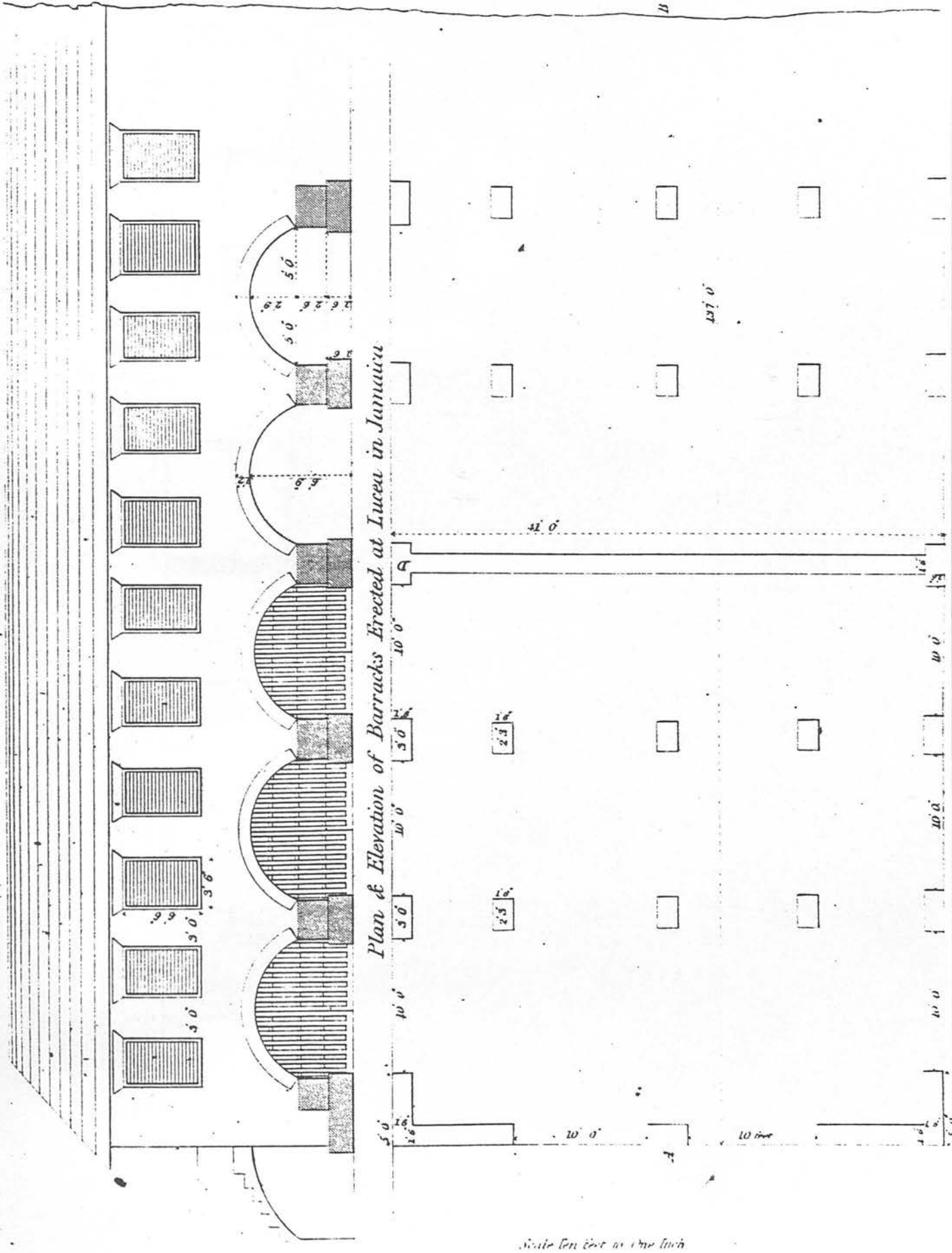
6. Colonel Sir C.F.Smith R.E., submitted the design for the Barrack room blocks in the tropics in 1824 and was approved by the Master General and Board of Ordinance.

Each floor had an open verandah around it, the rooms were of various lengths but maintained the same width. Each room had a door and a window open to the verandah on either side. The gable ends of the roof had openings covered with jalousies. (Fig.74).





21. Officer and detachment of a West Indian Regiment  
at the start of the 20th century.

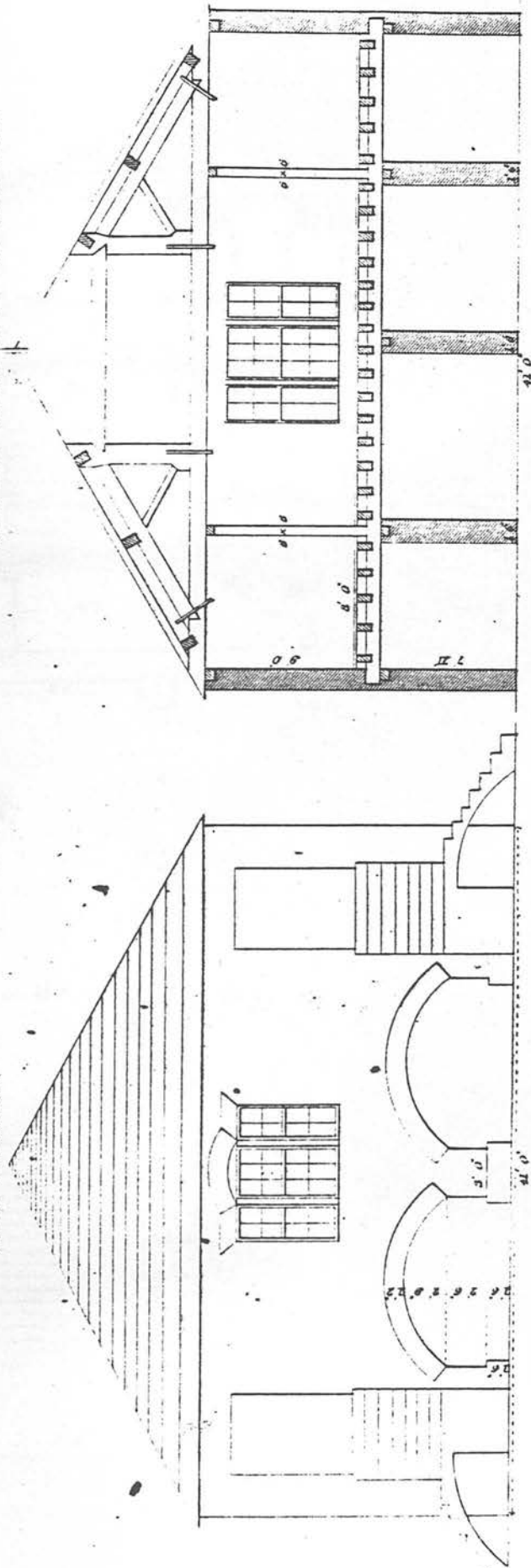


*Plan & Elevation of Barracks Erected at Lucea in Jamaica*

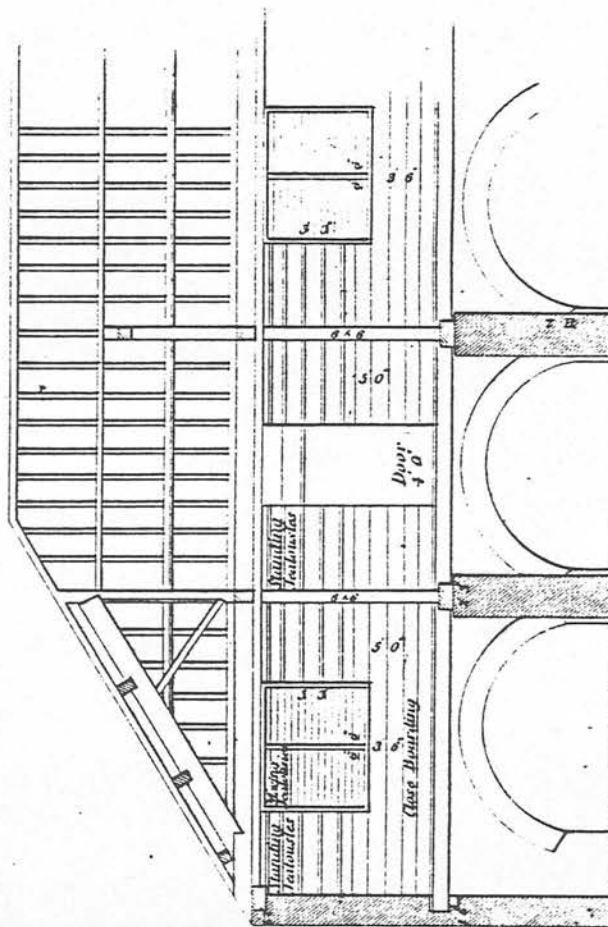
72a. Plan and Elevation of Barrack block at Lucea, Jamaica (19th century).

gable Elevation

Transverse Section at C-D on Plan Pl. 16.



Part of Longitudinal Section at A-B on Plan Pl. 16.



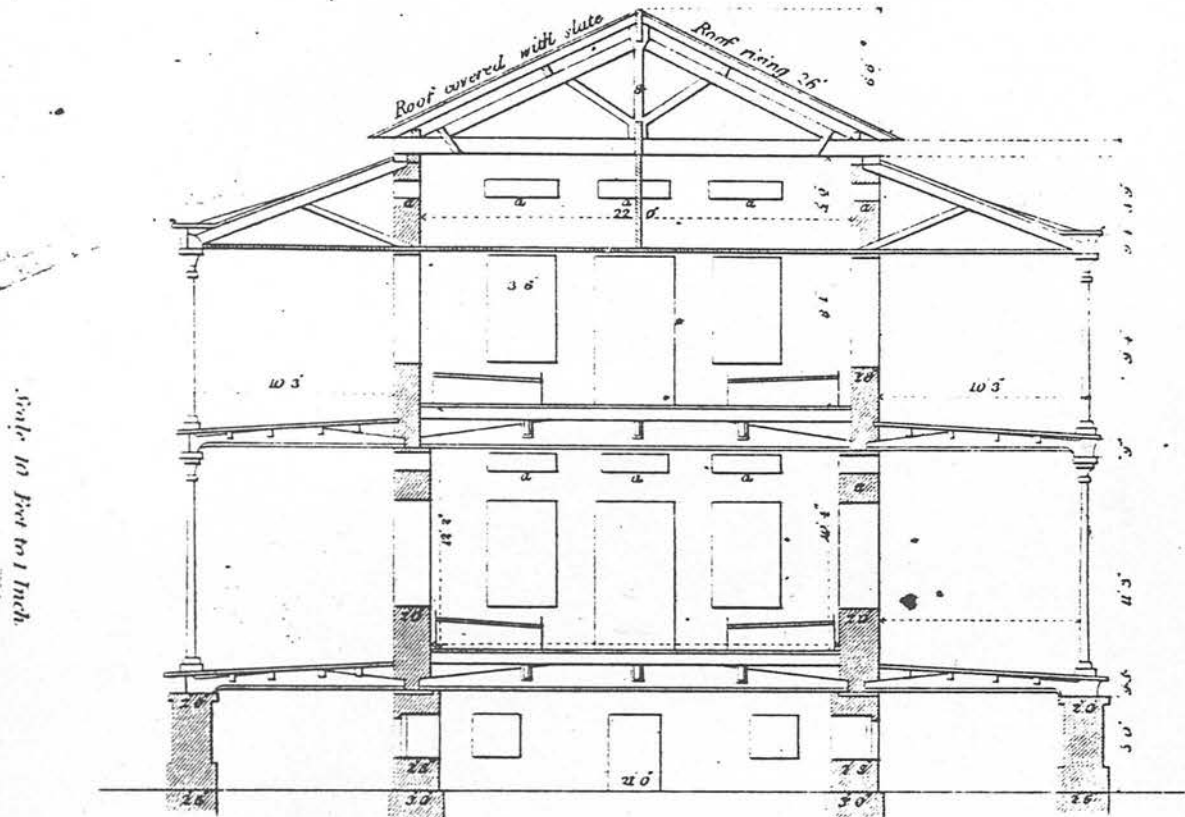
Scale Ten Feet to One Inch

72b. Sections and Elevation of Barrack block at Lucea, Jamaica.  
(see 72a.)





Fig. 3



\*Section thro the line A B shewing the mode of Ventilating the Rooms  
a. a. a. a. Apertures to receive the Ventilators

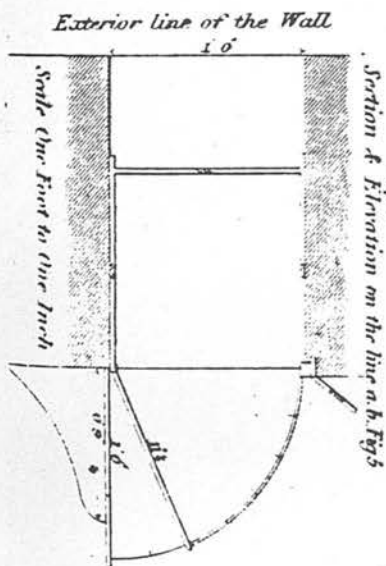


Fig. 6  
Section & Elevation on the line a. b. Fig. 5

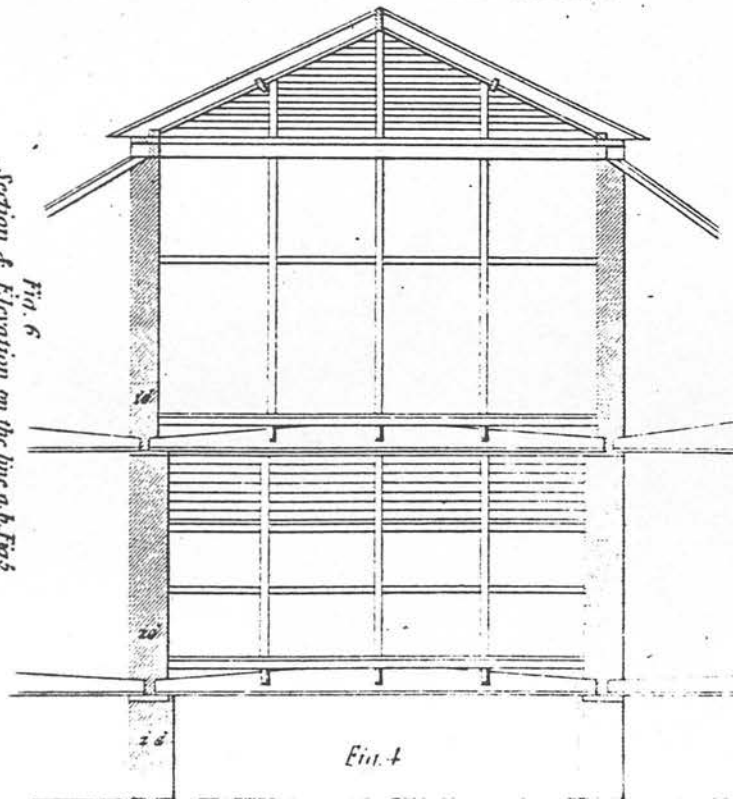


Fig. 4

Section and Elevation of the line C D Fig. 2 shewing  
the Saloon and Partitions of the Rooms

Scale 10' 0" to 1' 0"

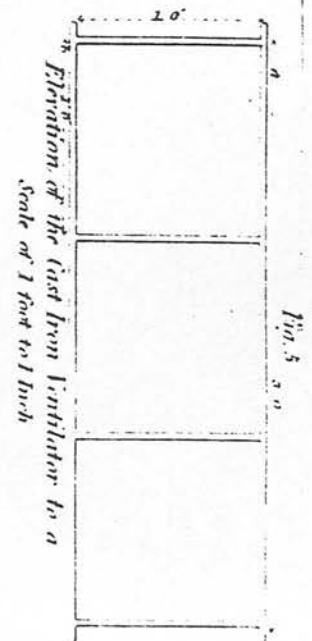
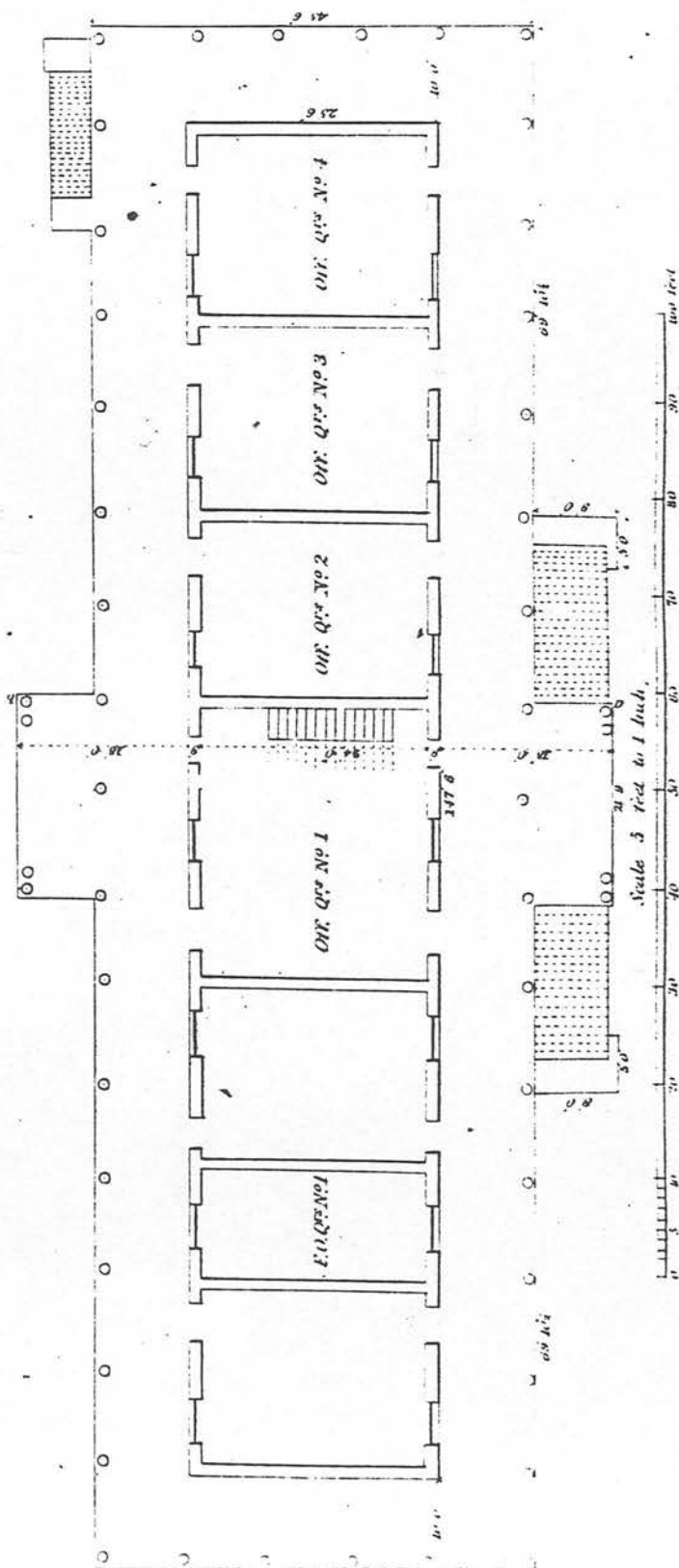
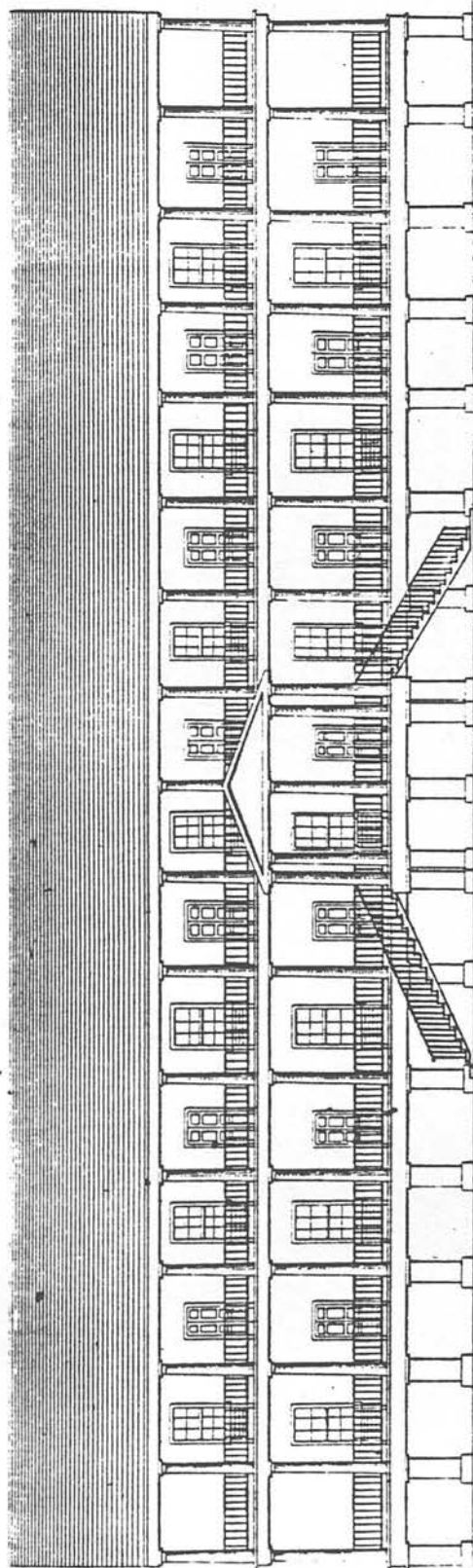


Fig. 5

23b. Section and Elevation of Colonel Smith's Barrack block  
(see 23a).

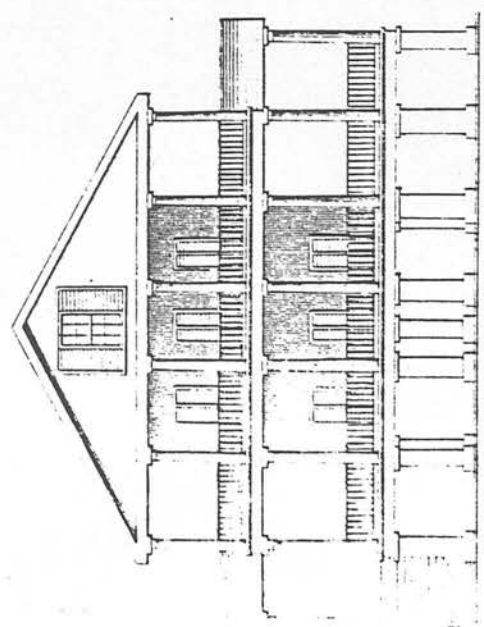
DEMARARA,  
Plan and Front Elevation of the Officers' Barrack at  
EVELEARY.



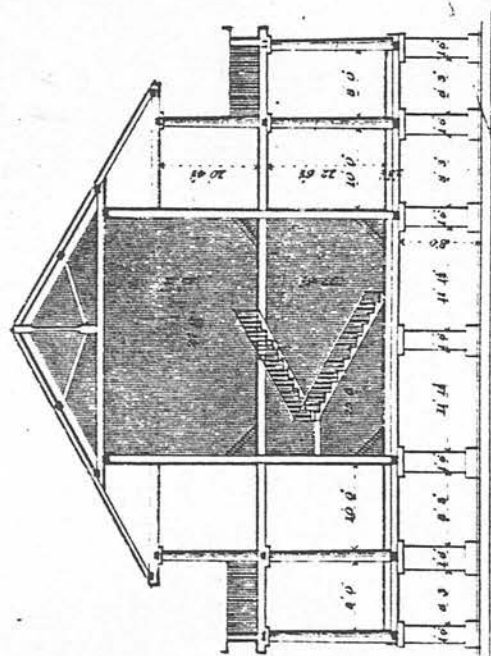
74a. Plan and Elevation of Officers' quarters at Demarara, West Indies (19th century).



*DEMERARA*  
*Final Elevation and Sections of the Officers' Barracks at*  
*EVELEARY*



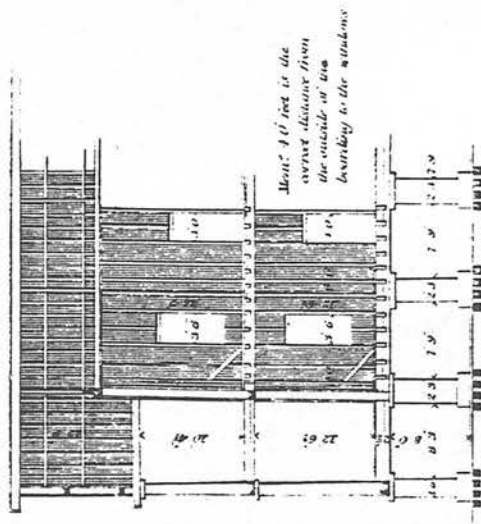
*Section on the line a b*



0 5 10 15 20 25 30 35 40 45 50 55 60 feet

*Scale 3 Feet to 1 Inch*

*Section on the line c d*



## INDIA

India covers an area of about 3,287,782 square kilometres, with every extreme of climate, terrain and vegetation. Its population over 600 million, is made up from a wide variety of races, languages and cultures.

The English venture to India was initially entrusted to the East India Company, which received its monopoly rights of trade in 1600. On August 2, 1858, the British power over India was transferred from the East India Company to the Crown by an Act of Parliament.<sup>7</sup>

In the early days of the Company's army, only European soldiers were employed. Not until the mid-eighteenth century were Indian sepoys enlisted and organised along Western lines. There were three separate armies before 1895. Bengal, Bombay and Madras. The three Presidency armies were abolished in 1895, and replaced by one army of India (Indian Army) divided into four commands. These were the Punjab, Bengal, Madras and Bombay Commands. Each was under the command of a Lieutenant-General, who was in turn responsible to the Commander-in-chief, India. In 1905, nine Divisional Commands were set up and Madras Command abolished.

The structure of the Indian Army conformed to those of conventional European Army formations of the period. Three or four Regiments formed a Brigade, and three or four Brigades made up a Division, about 10,000 strong, under the command, usually, of a Major-General. Two or more Divisions could be combined to form an Army Corps under a Lieutenant-General.

7. Brigadier C.N. Barclay, The Indian Army in Army (July 1967) pp 52 - 58 (p.52)

Each brigade of the Indian Army of this period had a least one British unit, with the rest Indian. Cavalry regiments and Infantry regiments were usually composed of men of different races and religions. A unit might have one or two squadrons or companies of Hindus and others composed of Muslims. There were, however, exceptions to this. Gurkha battalions were always composed exclusively of Gurkhas; there were also regiments which were exclusively Sikh and other exceptions to the general rule of mixed regiments. (Fig.75).

Mixing of races and religions never went below regiment or battalion. In squadrons and companies men were always of the same religion and of similar races.

The equipment within units was almost exactly the same as in the British army. Rifles, light machine guns, mortars, transport and so on, were all the same; and clothing very similar but adapted to the customs of the Indian soldier.

#### Housing of Soldiers

Prior to 1893, the Sepoy (as the Indian soldier was called), occupied quarters which they hired themselves in bazaars, but later they lived in huts containing two or three men, built by them at their own expense.<sup>8</sup> Special areas were allotted to them to build their huts, but these were without water supply, drainage or sanitation. The huts were crowded together and were made of timber frames, thatched with straw or similar combustible materials.

The British troops were quartered in different Barracks built by the Public Works Department of the East India Company and later the Military Works Department. A description of one of such barracks in which a British Regiment was quartered was given by Private Hall of the 14th

8. Army department, despatch No.40 1912, to Her Majesty's Secretary of State for India dated 14 March 1912 (Indian Office records: L/MIL/7/13225). Also "Hutting accommodation for native troops" (Indian Office records: L/MIL/7/13200 Collection 293).

Light Dragoons, who enlisted in December 1824 and served for twenty-two years.<sup>9</sup> He embarked for India in 1841.

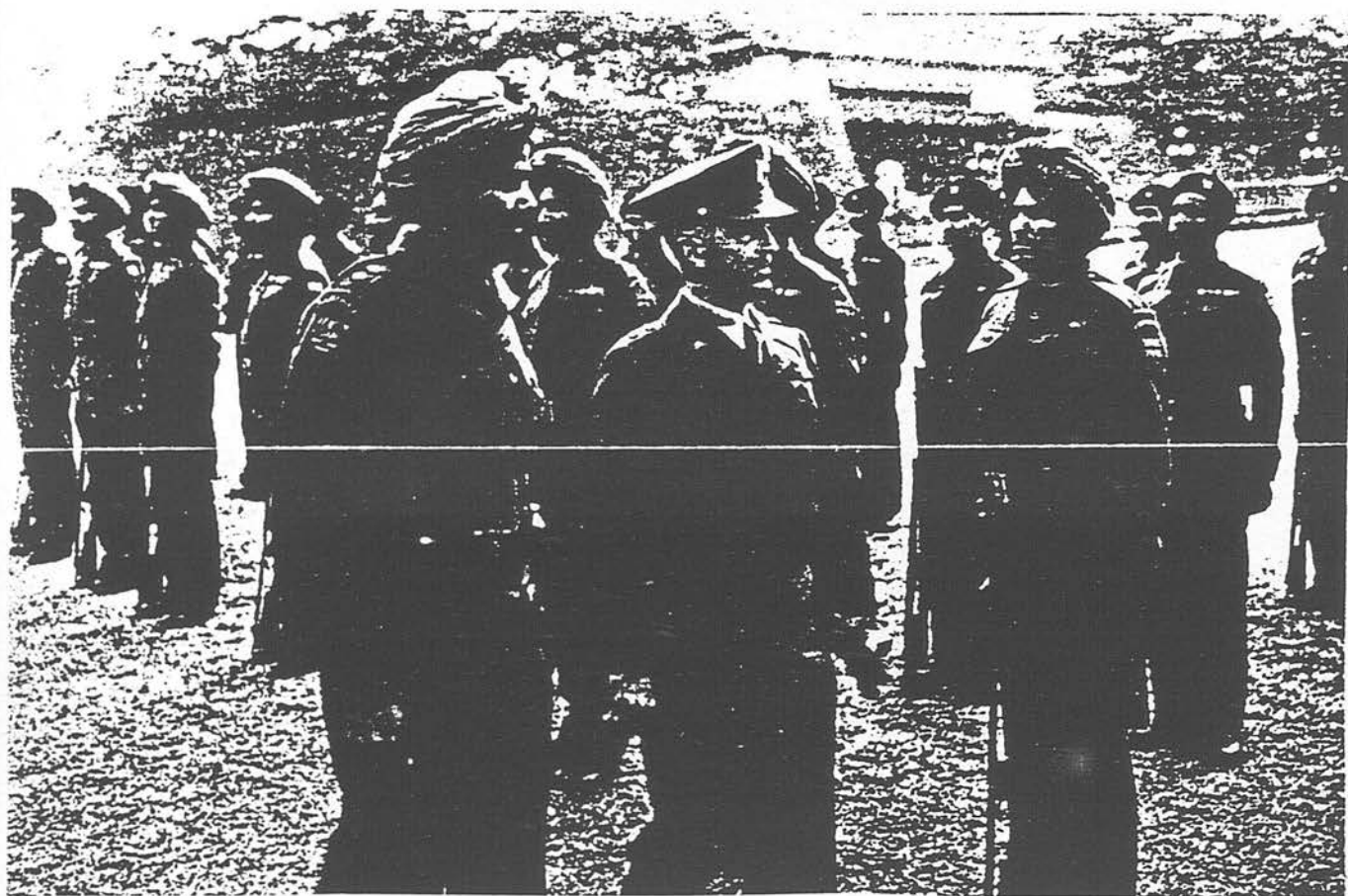
It had no perimeter wall to confine the soldiers. There was a level plain, stretching for two or three miles, where the regiment could go through all its exercises and gallop freely. There was a native bazaar where the men could buy whatever personal things they needed. On one side were the huts for the Indian grooms and grass-cutters allotted to the regiment and near these the farrier's shoeing shop, the veterinary officer's surgery and the horse hospital or lines for sick horses. The regiment's horses were kept in long lines in front of the Barrack, sixteen lines, two per troop, three yards apart. Behind these was the main guard or guardroom, a large building standing apart, containing the armoury and treasure chest; then eight bungalows, all in line, one for each troop Sergeant Major. In echelon behind these were sixteen large barrack rooms, each holding half a troop, with spacious latrines on either flank, some distance away, then all the usual offices of a regiment - the Roman Catholic chapel, the cookhouses, the armourers' shop, the canteen, the regimental sergeant-Major's bungalow, the school room, the quartermaster's store, a theatre, a ballroom, tailors' and shoemakers' shop, the picquet hut and the rear guard house. On either side of this complex were the married men's bungalows. Well to the rear were the officers' compounds, each bungalow usually occupied by only one officer, married or single. These compounds covered two or three acres. In the middle of these was the officers' mess, and the garrison Church.

9. T.A. Heathcote, The Indian Army (London: David and Charles 1974) pp 163-66.

By 1900 scales of accommodation were introduced for both Indian and British regiments. These were usually updated every four years until 1930.

The designs for Barrack Housing during the first half of the twentieth century in India were not exactly like other British Barracks elsewhere. There were different scales of accommodation for plain locations and for hill locations. In the Barrack blocks for married men, each block contained twenty quarters (Fig.76). Each quarter consisted of a room (3.66 x 3.66m) a verandah (3.66 x 2.4m) including a cooking space (2.4 x 1.5m), a courtyard (3.66 x 5.5m) and a bathing place (1.2m x 1.2m). This allows for some privacy for each family, though the space might be considered small in view of the average size of the soldiers' family during that period.

The unmarried men's Barrack block (Fig.77) consisted of: four dormitories, each (11.0m x 6m) accommodated 12 men, two non-commissioned officers rooms, each 3.7m x 2.8m; verandah 2.4m wide on both sides containing a store room 3.7 x 2.4m. There were also cooking sheds for the men, each block contained two sheds, each 13.7 x 3m.



75a. Indian soldiers on parade (early 20th century).



SIKH



GURKHA



RAJPUT



PUNJAB MUSLIM

75b. Indian soldiers.



Fig. 1.  
PLAN OF QUARTERS FOR MARRIED MEN.  
20 QUARTERS IN ONE BLOCK.



P. A. of one block of 20 Qrs. =  $271' \times 24' = 6525$  s. ft.

P. A. of one quarter =  $61'3'' \times 5'3'' = 326.25$  s. ft.

Stables.

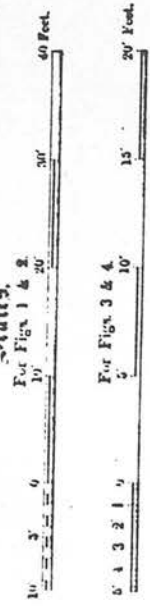
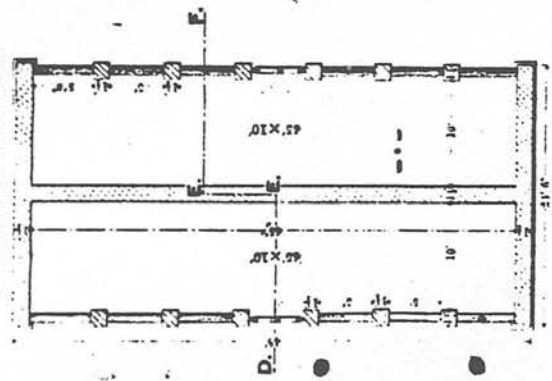


Fig. 2.  
PLAN OF COOKING SHED  
FOR SINGLE MEN (ONE COMPANY).



P. A. =  $487 \times 25 = 12175$  s. ft.

Fig. 4.  
SECTION ON A. B. C.

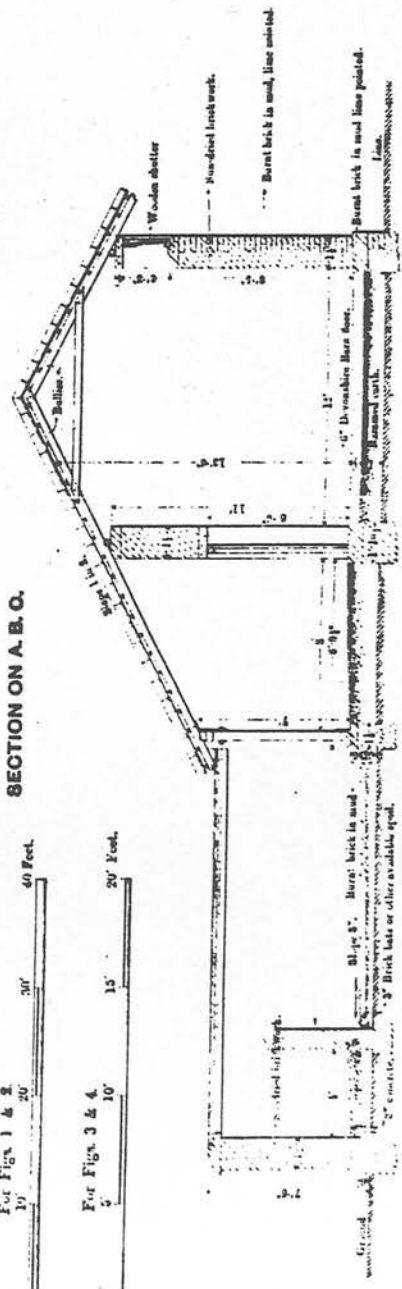
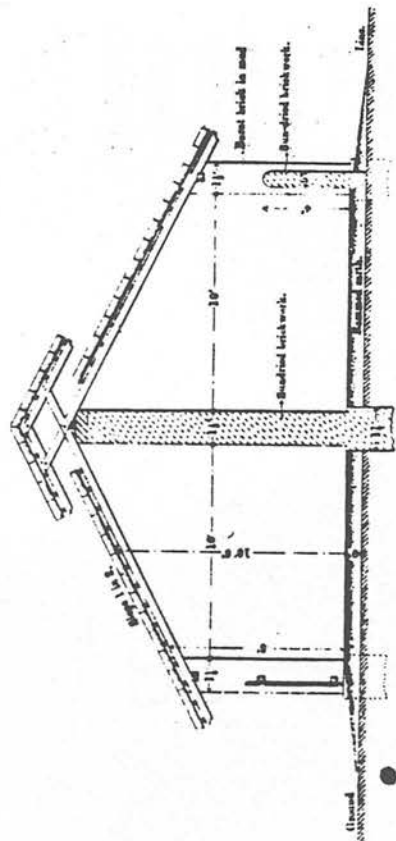


Fig. 3.  
SECTION ON D. E. F.



Notes.

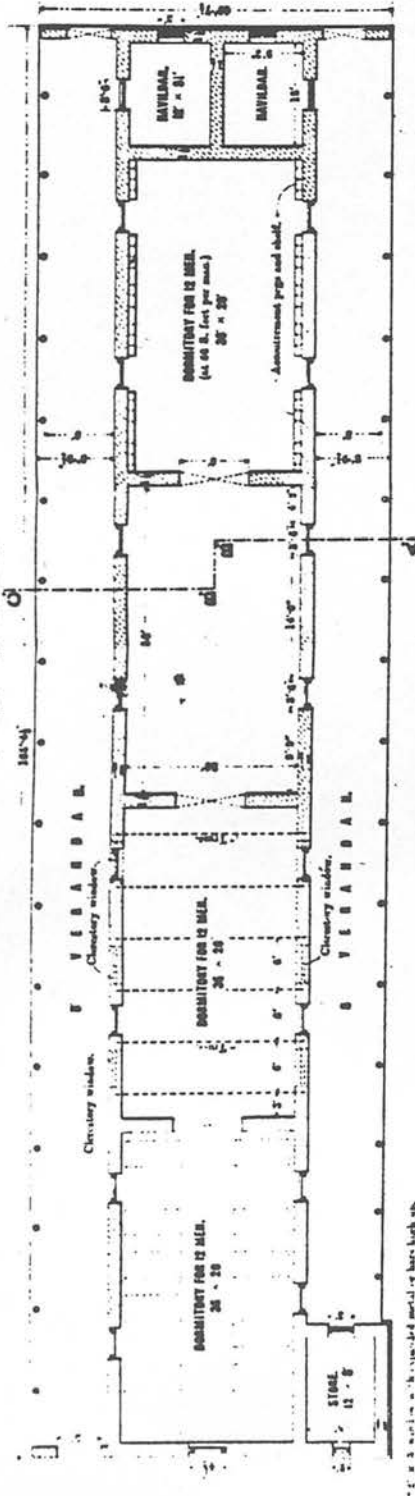
- I.—Exposed walls of quarters to be faced with burnt brick, lime pointed and properly bonded into the wall. High gable walls to be strengthened by buttresses or pilasters.
- II.—In localities infested with white ants steel instead of timber may be used for rafters, verandah posts, etc.
- III.—Floors of cook houses, latrines and bathing places to be pucca.
- IV.—Compound walls may be built of burnt bricks in localities subject to heavy rain.
- V.—Country tiles on squared latissus to be used in roofs, when good tiles are available, but bamboo matting and frame work is prohibited.
- VI.—Shelves and accoutrement pegs, preferably of reinforced concrete, to be given.
- VII.—Fireplaces are to be provided where fuel is authorized.
- VIII.—For Gurkha regiments court yards are not to be provided.
- IX.—This design is to be considered as a guide only, details of construction to be altered according to local circumstances, e.g., to suit substitution for collar beam or ridge pole provided.

H. Bond

Brigadier-General.  
Director-General of Military Works.

Fig. 1.  
PLAN.

Plinth Area =  $165' \times 40' + (15' \times 7') = 6,732.5$  Sq. Ft.



Notes.

- I.—Exposed walls of barracks to be faced with burnt brick, lime pointed and properly bonded into the wall. High gable walls to be strengthened by buttresses or pilasters.
- II.—One verandah of 6' in the clear to be suitably given, special attention is required for two of verandahs.
- III.—Barracks are not required on the north side of the building.
- IV.—In localities infested with white ants steel instead of timber may be used for rafters, verandah posts, etc.
- V.—Country tiles on squared battens to be used in roofs with good timbers are available. Handloom matting and frame work is prohibited.
- VI.—Shelves and acountreant paps, preferably of reinforced concrete, to be given.
- VII.—Fireplaces are to be provided where fuel is authorized.
- VIII.—This design is to be considered as a guide only, details of construction to be altered according to local circumstances.

Fig. 2.  
SECTION ON A. B. C.

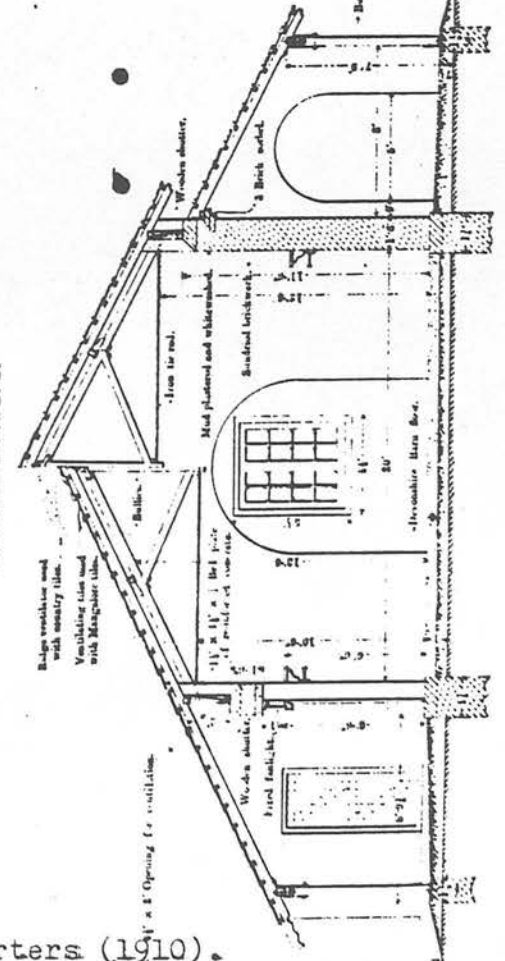
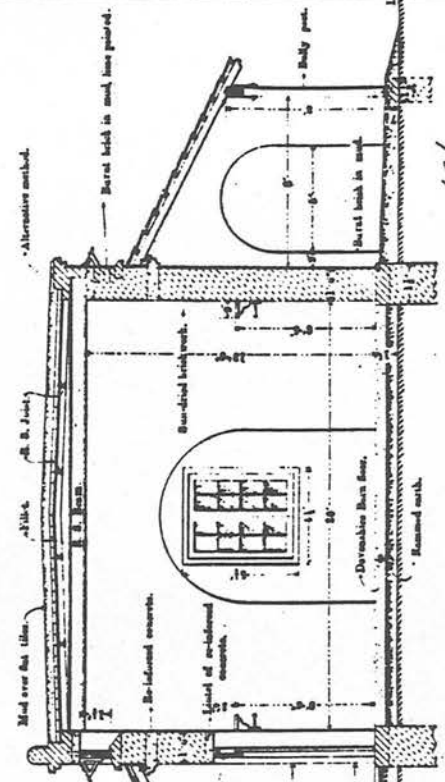
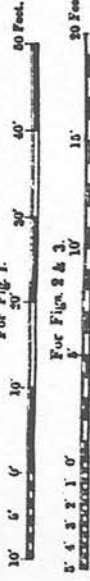


Fig. 3.  
ALTERNATIVE SECTION ON A. B. C. O.



Scales.  
For Fig. 1.  
50 Feet.



## GIBRALTAR

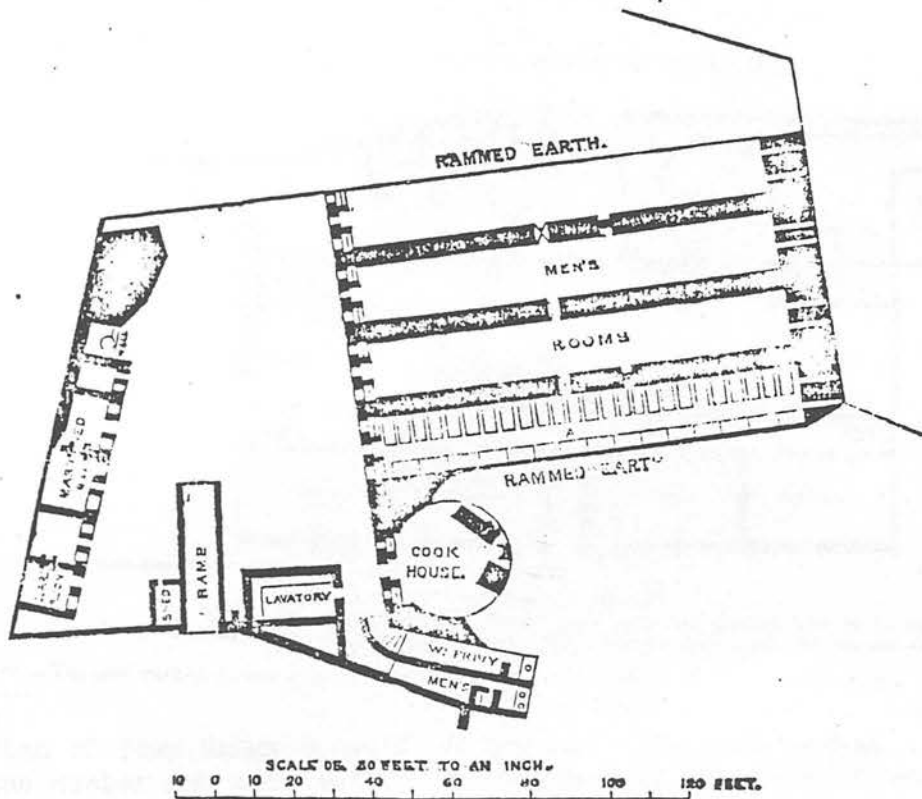
More than half the garrison of this British Colony was lodged in casemated buildings. These casemates were in bastions or curtains and had doors and windows only at one end, and at the other end there was a blank wall in the majority of cases. One or two illustrations of their designs will show the influences to which the men were exposed in these casemates.

Fig.78 gives a plan of the Orange Bastion Casemates. They were so crowded that the beds, as shown in the sketch, nearly touched each other along the wall on one side, while they actually touched each other along the opposite wall. It is quite evident that the probable effect on health and subsequently on morale, of this form of accommodation, never received its due consideration.

A plan of Wellington Front Casemates is shown in Fig.79. The casemates here were much shorter than in the Orange Bastion.

Barracks, not of casemated construction, differed in their layout. Fig.80 shows the left wing of Town Range Barrack. The rooms had windows on both sides, but they were greatly overcrowded, as shown on the sketch, by the position of the beds. In the South Barracks (Fig.81) the buildings enclosed a large courtyard which was transversed by three lines of married quarters. The Barrack rooms were partially divided.

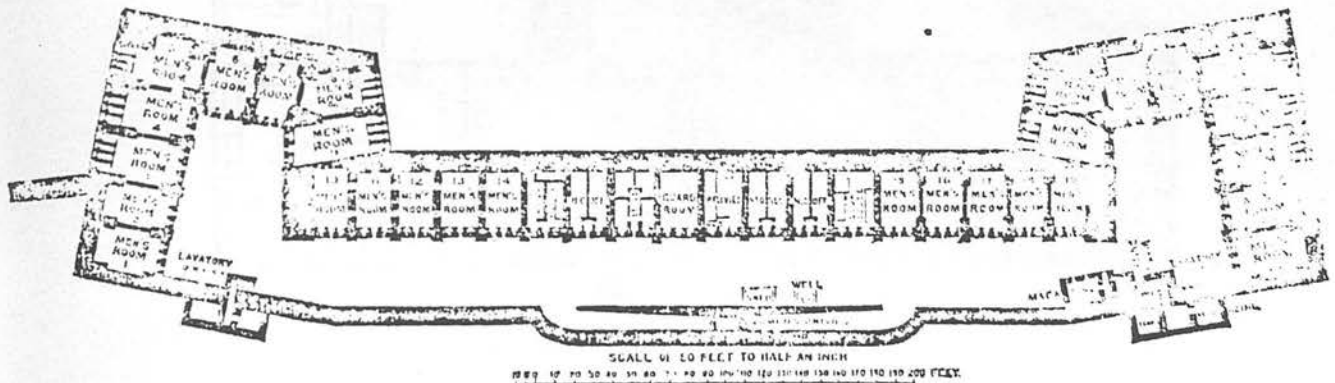
—ORANGE BASTION CASEMATES.



NOTE.—The part marked A shows the number and arrangement of the cots in each room (40 men). The width of the rooms is 14 feet, and the length 105 feet.

78. Plan of Orange Bastion Casemates, Gibraltar. The part marked A shows the number and arrangement of the beds in each room (40 men) The rooms were 4.2m by 32m.

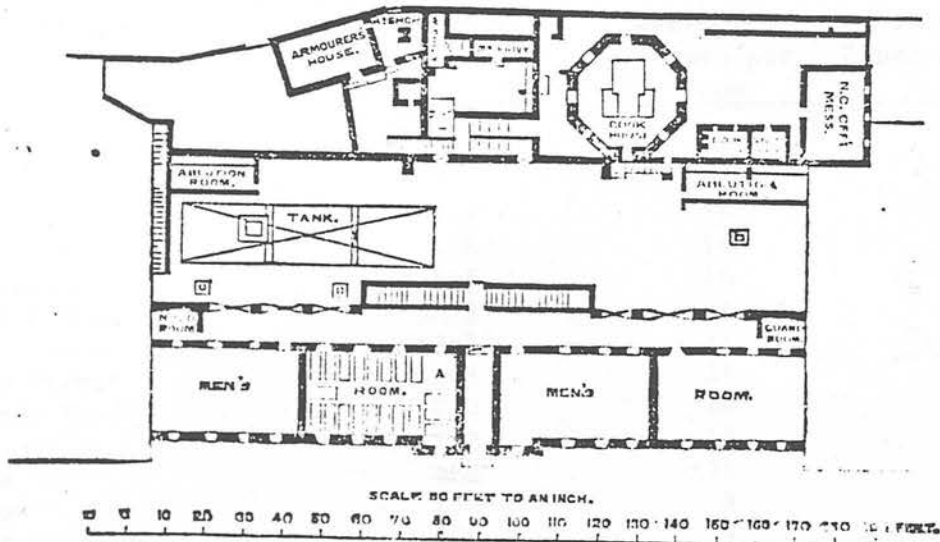
—WELLINGTON FRONT CASEMATES.



NOTE.—The walls between Nos. 1 and 9, and 15 to 17 are carried up to the spring of the arch, leaving space for ventilation between the spring and crown of the arch of one room into another room, also inhabited.

79. Plan of Wellington front casemates, Gibraltar

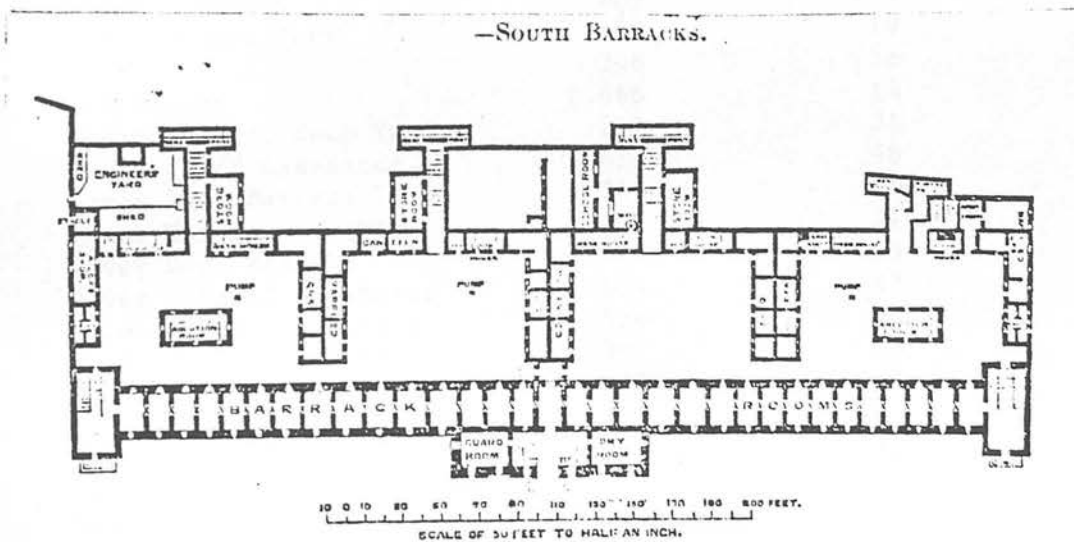
—TOWN RANGE (LEFT WING).



NOTE.—The part marked A shows the number and arrangement of cots in each room for 20 men.

80. Plan of Town Range Barrack, Gibraltar. The room marked A shows the number and arrangement of beds in each room for 20 men.

—SOUTH BARRACKS.



81. Plan of South Barrack, Gibraltar.

STATE OF 19th CENTURY BARRACK HOUSING

Name of Barrack	Total No. of men	Average No. of men per room	Average space per man sq.m.
ENGLAND			
Wellington	1,354	16	4.4
St.George's	426	16	4.6
Knightsbridge Cavalry	505	10	4.1
Hyde Park Magazine	79	16	3.7
Regent's Park	363	11	5.0
Portman Street	483	21	3.7
St.John's Wood	220	20	3.7
Tower	732	18	4.1
Croydon	460	26	3.7
Hounslow	232	8	4.6
Windsor Cavalry	291	9	4.1
Windsor Infantry	922	22	3.7
Chatham	2,700	16	3.1
Spur Battery	36	6	3.6
Brompton	1,725	16	3.3
St.Mary's Casemates	1,128	24	3.3
Woolwich	3,508	17	3.6
Portsmouth:-			
Anglesea	954	18	4.6
Clarence	912	15	4.1
Cambridge	1,012	20	4.1
Colewort Infantry	238	17	3.6
Colewort Artillery	185	27	4.1
Royal Engineers	99	33	4.1
Point Battery	80	20	4.6
Fort Moncton	289	10	3.4
Blockhouse Fort	92	19	5.5
Haslar	346	16	4.6
Winchester	1,666	14	4.0
Dover Castle, Keep Yard	241	31	2.9
Dover Cliff Casemates	414	46	4.6
Dover Spur Battery	245	17	2.9
Dover Western Heights	1,071	21	4.6
Dover Drop Redoubt	75	25	4.1
Dover Citadel Casemates	654	27	4.1
Walmer, North Infantry	436	26	4.1
Walmer, South Infantry	397	18	4.1
Walmer Cavalry	72	8	4.6
Shorncliffe Royal Artillery	104	13	4.6
Hythe	268	15	4.1
Canterbury Cavalry	270	9	4.6
Canterbury Artillery	225	15	4.0
Canterbury Permanent Infantry	820	20	4.1
Canterbury North Gate	420	20	4.1
Maidstone	360	18	4.1
Hulme	400	10	4.6
Salford	885	15	4.1
Burnley	240	12	3.2
Bury	312	16	4.1



State of 19th Century Barrack Housing (Continued)

Name of Barrack	Total No. of men	Average No. of men per room	Average space per man sq.m.
Stockport	160	16	4.1
Ashton	302	16	4.6
Preston	1,114	15	4.1
Brighton Cavalry	402	13	4.1
Brighton Infantry	288	16	4.1
Exeter Cavalry	184	8	4.5
Exeter Artillery	336	12	4.1
Bristol Infantry	320	16	4.2
Bristol Cavalry	108	11	4.6
Devenport:-			
Raglan	958	23	4.6
Mount wise	257	18	4.6
Granby Artillery	144	24	5.0
Granby Infantry	144	15	4.1
Bull point	96	16	4.6
Plymouth Citadel	1,083	12	3.4
Plymouth Prince of Wales			
Redoubt	72	18	4.6
Plymouth Maker Barrack	166	19	3.4
Plymouth Picklecombe	96	11	4.1
Plymouth St.Nicholas Island	130	9	3.4
Birmingham	180	9	4.9
Coventry	192	12	3.7
Weedon	456	15	4.1
Northampton	208	13	3.9
Liverpool, North fort	200	25	4.6
Liverpool, Recruiting Barrack	148	11	4.1
Chester	284	19	4.6
Gravesend	51	8	4.1
Tilbury Fort	201	15	4.0
York	308	11	4.0
Leeds	336	12	5.0
Bradford	180	12	4.1
Newcastle	462	18	4.6
Sunderland	300	20	4.0
Tynemouth	234	24	4.1
Carlisle	274	18	3.5
Sheffield	811	18	4.2
Christchurch	145	14	4.1
Landguard Fort	160	9	2.9
SCOTLAND			
Edinburgh Castle	709	10	3.4
Piershill	296	8	4.6
Leith Fort	241	11	3.3
Berwick	720	10	3.4
Stirling	484	31	4.1
Glasgow	792	12	3.9
Ayr	432	12	4.0
Paisley	240	15	4.1
Hamilton	500	17	4.0

State of 19th Century Barrack Housing (Continued)

Name of Barrack	Total No. of men	Average No. of men per room	Average space per man sq.m.
Dumbarton	114	9	4.0
Fort Augustus	166	6	4.6
Aberdeen	552	12	3.9
Dundee	299	28	3.7
Perth	382	18	4.1
Fort George	1,400	8	4.6
IRELAND			
Dublin, Royal Barrack	1,917	11	3.4
Arbour Hill	91	16	4.0
Island Bridge	578	24	4.1
Ship Street	610	15	3.4
Portobello	687	18	4.1
Richmond	1,036	13	4.1
Beggar's Bush	413	17	4.6
Pigeon House Fort	199	12	4.1
Aldborough House	275	14	4.6
Linen Hall	1,094	9	3.4
Limerick New Barrack	869	12	4.1
Limerick Ordinance	164	17	4.1
Limerick Castle	204	17	4.1
Templemore	1,125	15	4.2
Cahir	391	17	4.0
Clonmel Infantry	476	14	4.1
Clonmel Infantry	161	18	4.1
Waterford Infantry	384	18	4.1
Waterford Artillery	90	15	3.4
Duncannon Fort	188	8	3.4
Kilkenny	586	20	4.0
Newbridge	832	16	4.1
Carlow	204	12	4.1
Birr	1,105	17	4.1
Cork Barracks	1,926	15	4.2
Cork Cat Fort	100	20	4.0
Cork Elizabeth Fort	180	10	4.1
Ballincollig	388	12	4.2
Carlisle Fort	77	20	4.1
Camden Fort	165	33	4.0
Spike Island Casemates	112	10	4.6
Haulbowline	98	25	4.1
Bandon	100	9	4.1
Kinsale	454	8	4.1
Charles Fort	344	8	4.1
Buttevant	910	14	4.1
Mallow	88	7	3.4
Tralee	392	18	4.1
Fermoy New	1,152	16	4.1
Fermoy Cavalry	198	11	3.4
Fermoy Old Infantry	1,282	16	4.0
Longford Cavalry	168	14	4.9

State of 19th Century Barrack Housing (Continued)

Name of Barrack	Total No. of men	Average No. of men per room	Average space per man sq.m.
Longford Artillery	106	16	4.6
Mullingar	901	17	4.1
Galway Castle	120	10	4.1
Galway Shamble	256	8	4.0
Athlone	879	18	4.2
Belfast Infantry	840	20	4.2
Belfast Artillery	104	13	4.0
Enniskillen Main Barrack	268	10	4.0
Enniskillen Castle	84	12	4.1
Enniskillen Redoubt	63	11	4.6
Londonderry	272	20	4.6
Dundalk	352	16	4.1
Newry	640	13	4.0
Naas	336	16	4.1
Brompton (huts)	528	22	3.3
Woolwich, Royal Engineers (huts)	90	24	2.8
Woolwich Hut Encampment (huts)	1,008	24	2.8
Shorncliffe (huts)	4,800	25	2.9
Chichester (huts)	572	14	2.9
GIBRALTAR			
Grand Casemates	1,166	45	3.4
Orange Bastion	160	40	3.4
Prince Albert's Front	114	29	3.1
King's Bastion	256	16	3.6
Wellington Front	533	20	2.8
Moorish Castle	80	20	3.3
Gunners Barrack	24	12	3.8
Town Range	320	20	3.3
Hargreaves	131	60	3.0
Jumpers Bastion	192	32	3.3
Rosia Casemates	72	12	3.3
South Barrack	696	58	3.7
Rosia Barrack	549	137	4.6
Buena Vista Barrack	416	34	2.7
Windmill Hill Barrack	634	25	2.7
WEST INDIES			
All locations		18	3.6
INDIA (1910)			
All locations		12	5.6
GHANA (1945)			
All locations (corporals & privates)		3	3.7
All locations (warrant officers & sergeants)		2	5.6
NIGERIA (1945)			
All locations (corporals & privates)		3	3.7
All locations (warrant officers & sergeants)		2	5.6

### CHAPTER THREE

#### COLONIAL WEST AFRICA

In the nineteenth century, European missionaries, traders and explorers began to penetrate into the West African interior, gathering information, seeking to make converts to christianity and establishing outposts of European trade. Soon there followed European soldiers and administrators who conquered and established Colonial Empires for Britain, France, Germany and Portugal.

By 1900, the whole of West Africa (except the Republic of Liberia) had been divided out by diplomatic agreement among the colonising nations of Europe, whose armed representatives were every where advancing to make their rule effective.<sup>1</sup> On the whole there was little resistance, perhaps because the Maxim guns were used by the European military to bring the campaign to a speedy conclusion.

Military conquest as a means of imposing and consolidating European presence and rule in West Africa went back to a much earlier time. For the French, it was Lt.-Col. (later General) Louis Faidherbe who initiated it with what S.H.Roberts described as his "delightfully simple policy of "peace and powder",<sup>2</sup> while the British origin can be traced back to the "gunboat politics" of Consul Beecroft, the first notable result of the policy being the bombardment of Lagos in 1851 and its annexation in 1861.<sup>3</sup> The ultimate explanation for the ineffectiveness of West African resistance to the colonial conquest lay in the superiority of the Colonial Armies in arms, experience and strategy.

1. J.D. Hargreaves, "The European Partition of West Africa", in J.F.A. Ajayi and M.Crowder editors, History of West Africa (London Longman 1974) p.402
2. S.H.Roberts, History of Fench Colonial Policy (Oxford, Oxford University Press, 1929) p.302
3. J.F.A. Ajayi, "The British occupation of Lagos 1851-1861, in Nigeria Magazine, 69, (Aug.1961) p.5.

Military conquest was the preliminary to the actual organisation and consolidation of Colonial rule in West Africa. In order to convince the people that European rule had come to stay, the French, the British and the Germans, took steps to strengthen their hands against sub-sequent threats to their positions. Colonial armies were established primarily to keep law and order in the newly acquired Colonies. Before the outbreak of World War I (1914-1918) once their pacification of a Colony had been completed, the Colonial armies increasingly adopted the role of auxiliary police forces which, in times of rebellion, could return to their basic military function. They also performed ceremonial functions. France alone before the outbreak of the war had used West African troops outside their homelands, notably in Guiana, Mexico, the Franco-Prussian War, Algeria, Morocco, the Congo and Madagascar. During the war, France used African troops on the European front, while Britain used West African troops and carriers in their East African and Mesopotamian campaigns.

British West Africa consisted of four separate Colonies - Gambia, Sierra Leone, Gold Coast (now Ghana), and Nigeria - strung along the African coast line over a distance of more than 3,000 kilometres and separated from each other by French Territories and the Republic of Liberia. Besides being a source of vital war materials, the four Colonies were of great strategic importance as links in the chain of Allied communication by sea and air.

By 1901, Britain amalgamated all the forces defending British territories in West Africa into one common force which became known as the Royal West African Frontier Force (RWAFF.)

## ROYAL WEST AFRICAN FRONTIER FORCE (RWAFF)

The RWAFF was a regular military force, recruited from a nucleus of officers and men of the Royal Niger Constabulary<sup>4</sup>, the Lagos Constabulary<sup>5</sup>, Gold Coast (Ghana) Constabulary<sup>6</sup>, Sierra Leone Police Corps<sup>7</sup>, and the Niger Coast Constabulary<sup>8</sup>. Officers and British NCO's were seconded from their British Regiments for short periods. Captain and Brevet Major (local Colonel) Frederick Lugard was its first Commandant.

The RWAFF was re-organised in 1914. The new organisation had barely time to settle down when the War (1914-1918) broke out in August 1914.

4. Colonel A. Haywood and Brigadier F.A.S. Clarke, The History of the Royal West African Frontier Force (Aldershot: Gale and Polden 1964) p.30. In 1886, the Royal Niger Constabulary came into being after the Royal Niger Company accepted the responsibility for administering the territory north of the river Niger (Northern Nigeria). Eleven years later, in 1897, it formed the nucleus of the 1 and 2 special service corps batallions WAFF, subsequently named 1 and 2 Batallions Northern Nigeria Regiment in 1900.
5. Ibid., p.5. In 1863 Lieutenant Glover, R.N., (later Sir John Glover) Governor of Lagos, formed the Lagos Constabulary, known as "Glover's Hausas", for the defence of Lagos. The force was later incorporated into the RWAFF as Lagos Batallion in 1901.
6. Haywood and Clarke, The History of the RWAFF, p.37. In 1873, Major-General Wolseley commanded 12,000 British troops, 500-700 West Indian Regiment and a few hundred Lagos Hausas (Lagos Constabulary), to prevent the capture of Elima. After this operation, 300 Lagos Hausas remained behind to form the nucleus of the Gold Coast Constabulary, which was raised in 1879 with and establishment of 16 European officers and 1,203 Africans. It retained this designation until its incorporation into the RWAFF as the Gold Coast Regiment in 1901.
7. Ibid. In 1829, after the Crown took over the administration of Sierra Leone, the Sierra Leone Police Corps for the defence of the country was formed with 17 officers, 23 NCO's and 300 African Creoles, Mendes and Timinies. it was incorporated into the RWAFF as Sierra Leone Batallion in 1901.



8. Haywood and Clarke, The History of RWAFF, p.7. A force known as the "Oil Rivers Irregular" was raised for the protection of the Niger Coast Protectorate (Southern Nigeria). It was renamed Niger Coast Constabulary in 1891 and in 1898 became the nucleus of the 3rd Battalion RWAFF, which later became Southern Nigerian Regiment, RWAFF. It amalgamated with the Northern Nigerian Regiment to form the Nigerian Regiment.

Composition of the RWAFF in 1914 <sup>9</sup>

Formation	(Batteries Artillery)	(Batallions) Infantry	Batallion Mounted Infantry
Nigeria Regiment (2)	4-gun 29.5in	4 (30 coys)	1 (3 coys)
Gold Coast Regt. (1)	2-gun 29.5in	1 (8 coys)	-
Sierra Leone Bn.	-	1 (6 coys)	-
Gambia Company	-	- (1 coy)	-
TOTAL	(3) 12 guns	6 (45 coys)	1 (3 coys)

The RWAFF took part in various campaigns during the 1914-18 war. These included campaigns in Togoland, the Cameroons and East Africa. During the early twenties, the RWAFF settled down to peacetime soldiering once more. In 1939, prior to the outbreak of World War II, the order of battle of the RWAFF was as follows:-

Nigeria

Regimental Headquarters	KADUNA
Headquarters No.1 Area	KADUNA
1st Battalion	KADUNA
2nd Battalion	KANO/SOKOTO
5th Battalion	ZARIA/MAIDUGURI/YOLA
Light Battery	ZARIA
Signal Training Centre	ZARIA
Regimental Depot	ZARIA
Engineer Cadre (Territorial)	JOS
Headquarters No.2 Area	ENUGU
3rd Battalion	CALABAR/OKIGWE
6th Battalion	ENUGU
4th Battalion	IBADAN/LAGOS

Gold Coast (now Ghana)

Regimental Headquarters (including Signals, Band & Drums, Pioneers, Armourer, Tradesman, Quartermaster Stores)	ACCRA
Light Battery	ACCRA
1st Battery	TAMALE
2nd Battaltion (Cadet Cadre)	KUMASI

Gold Coast (Continued)

5th Battalion (Territorial)

ACCRA

Sierra Leone

One Infantry Battalion (less one Company)

FREETOWN/DARU

Gambia

Gambia Company

CAPE ST.MARY

In 1940, RWAFF was increased to a strength of 28 Battalions. Later 2 Divisions were sent to Burma which included 18 RWAFF Infantry Battalions, during the World War II. Some of its Battalions were also sent to the East African theatre. In between the two wars, the RWAFF were called upon at various times for "Duty in Aid of Civil Power". However, by March 1960, the units previously belonging to the RWAFF were absorbed into the Royal Nigeria Military Force, the Sierra Leone Military Force and the Ghana Army. The RWAFF thus ceased to be an entity. These forces formed the nuclei of their respective countries' present day Army.

Barrack Housing, the RWAFF

Lieutenant-Colonel P.F. Pritchard in giving his account of service in West Africa 1927 to 1933<sup>10</sup>, said "..... At Ibadan we lived in bush houses, that is houses built of mud, with grass roofs and matting doors and window coverings..... No tentage existed, so none was carried. On manoeuvres, we lived in huts made by the troops from grass and branches..." He went further " Domestic arrangements in Barracks were equally simple. The troops fed themselves, receiving chop money each week in addition to their pay, which was issued monthly.

10. Haywood & Clarke, History of RWAFF. p.318.

All African troops, except recruits, had wives in Barracks who cooked for their lords and kept the huts and lines clean."

Prior to World War II, the RWAFF, for the purpose of accommodation, was treated as a Colonial force on local scales, and all Barrack Housing were provided by the Colonial Governments and built and maintained by the Public Works Department. Most African quarters and administrative buildings, were constructed in swish<sup>11</sup> or in timber (see fig 85-91).

Roofing was of grass thatch or corrugated iron. Depending on the location the quarters were either round houses built in swish with grass or corrugated iron sheet, or long rectangular buildings, built in swish but rendered externally with cement, divided into a series of single rooms each, housing a soldier and his family or three unmarried soldiers.

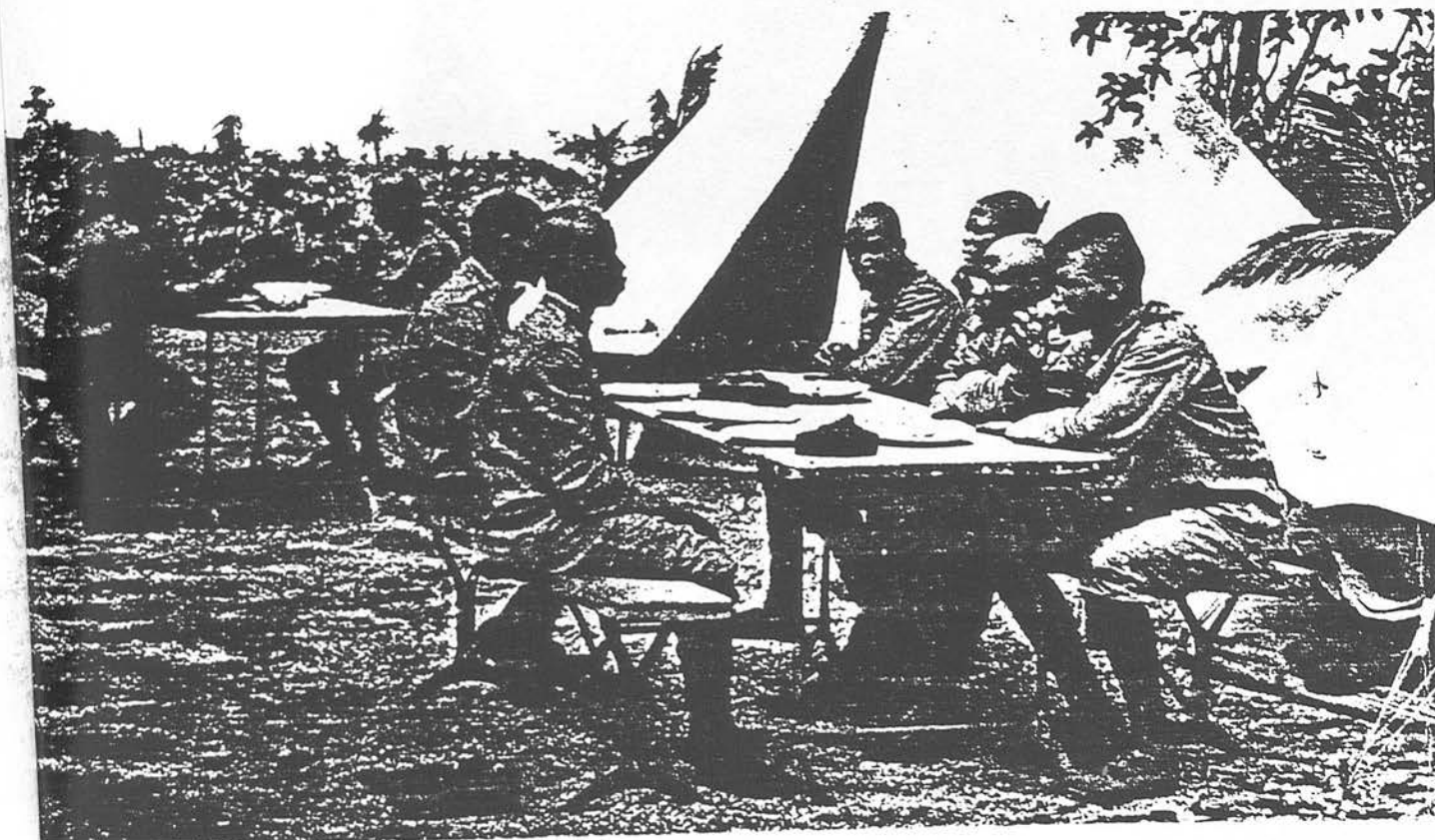
11. Swish is the local name for the laterite clay mix with water

It can be made into blocks used in building or by mixing lumps in hand and building the wall up in stages of about one metre per day, or may be used on a bamboo or pole framework. The practice varies in different localities.

The expansion of the RWAFF at the outbreak of the war necessitated a very large work programme. Accommodation had to be provided for the new recruits raised. Base Depots and installations had to be established and communications improved. In view of the submarine menace and the competition for the small quantities of imported materials that were available, local methods of construction became necessary especially in remote and inaccessible places. Most of the work during the war was therefore of temporary construction or alterations and additions to requisitioned buildings. Some round and rectangular buildings were constructed with wattle and daub <sup>12</sup> walls, with timber framed roof, clad with shingle. <sup>13</sup> Some had walls framed of square timber or Rhun Palm <sup>14</sup> and clad with matting <sup>15</sup>, tukarua <sup>16</sup> or split bamboos. The "Lagos type" hutting was timber framed and was often used for European quarters, offices and store, while the "Ark type" huts were mainly used to accommodate the African troops (See fig.92-103).

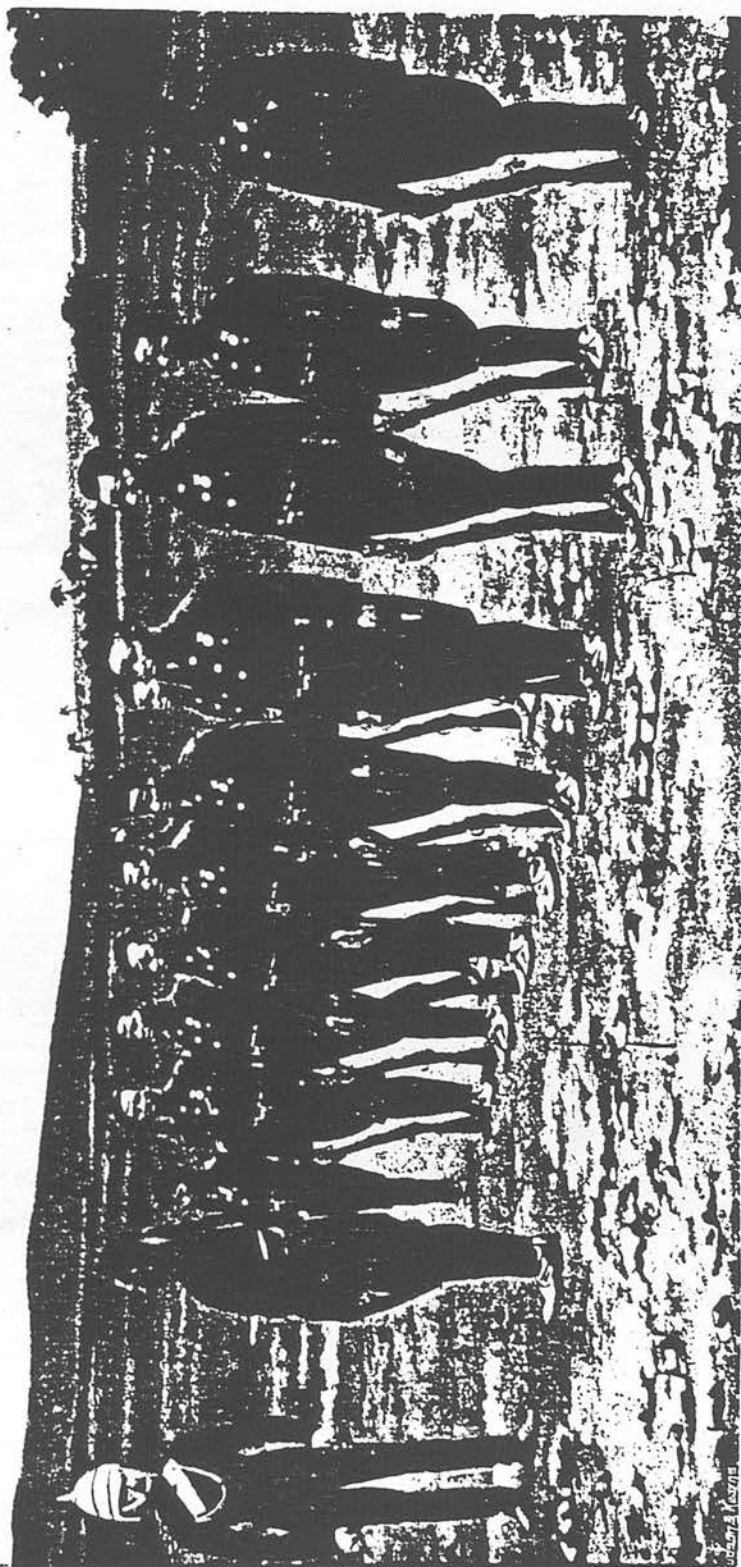
12. This is lath and mud plaster composed of laterite clay and bush sticks.
13. These were split wooden tiles fastened with wooden dowels.
14. This is a species of palm, split in quarters longitudinally used where available for the framework of Bush construction.
15. These were mats of local material used for ceiling and interior walls. There were different types viz. Zana mats usually 1.8m x 1.2m used for screens: Adobe or Mimi made of split cane about 1.8m x 1.2m used for ceilings, screens and interior walls; and the Zibri, also 1.8m x 1.2m used for screen and interior walls.
16. Tukarua are the leaf fronds of a species of palm. These grow 1.8m to 3m long and are approximately half round in shape. Used for inner walls.

82- Non-commissioned officers and  
Private, Royal Niger Hansa  
(1900)

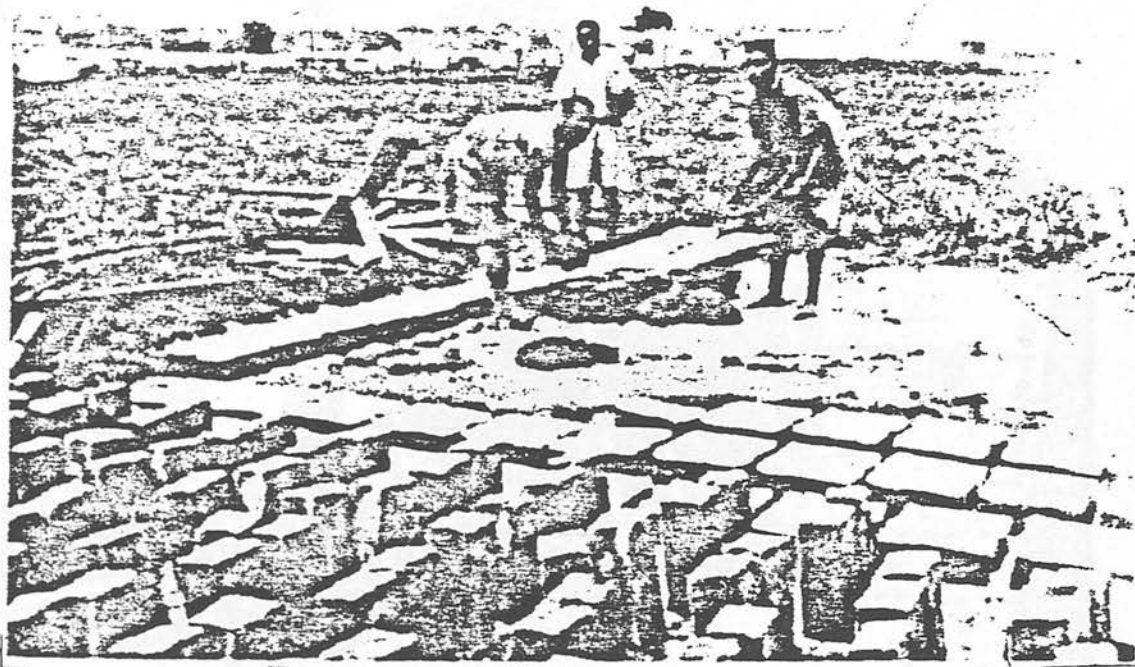


83- Roval Niger Hausa at dinner 1900.





84. Officer, Non-commissioned officer and detachment  
Sierra Leone (1900).



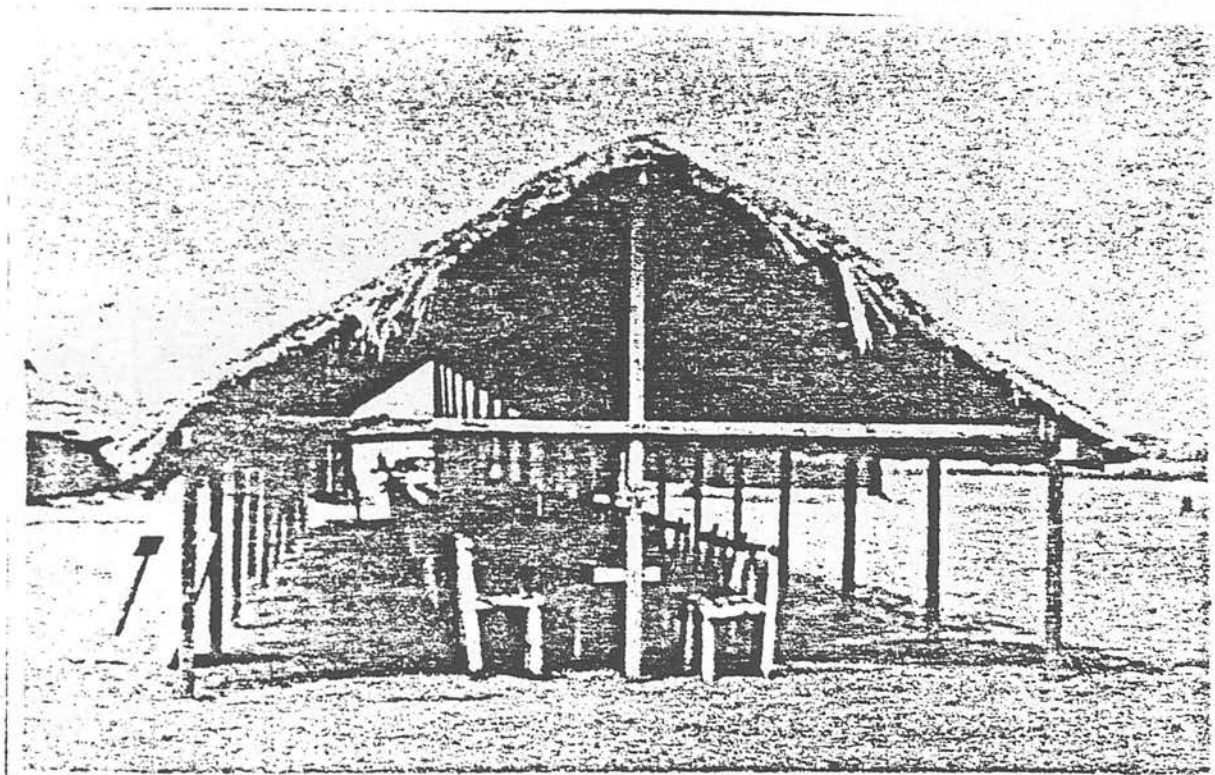
85. Preparing swish blocks, West Africa (1945).



86. Preparing sandcrete blocks (cement and sand semi dry mix), West Africa (1945).

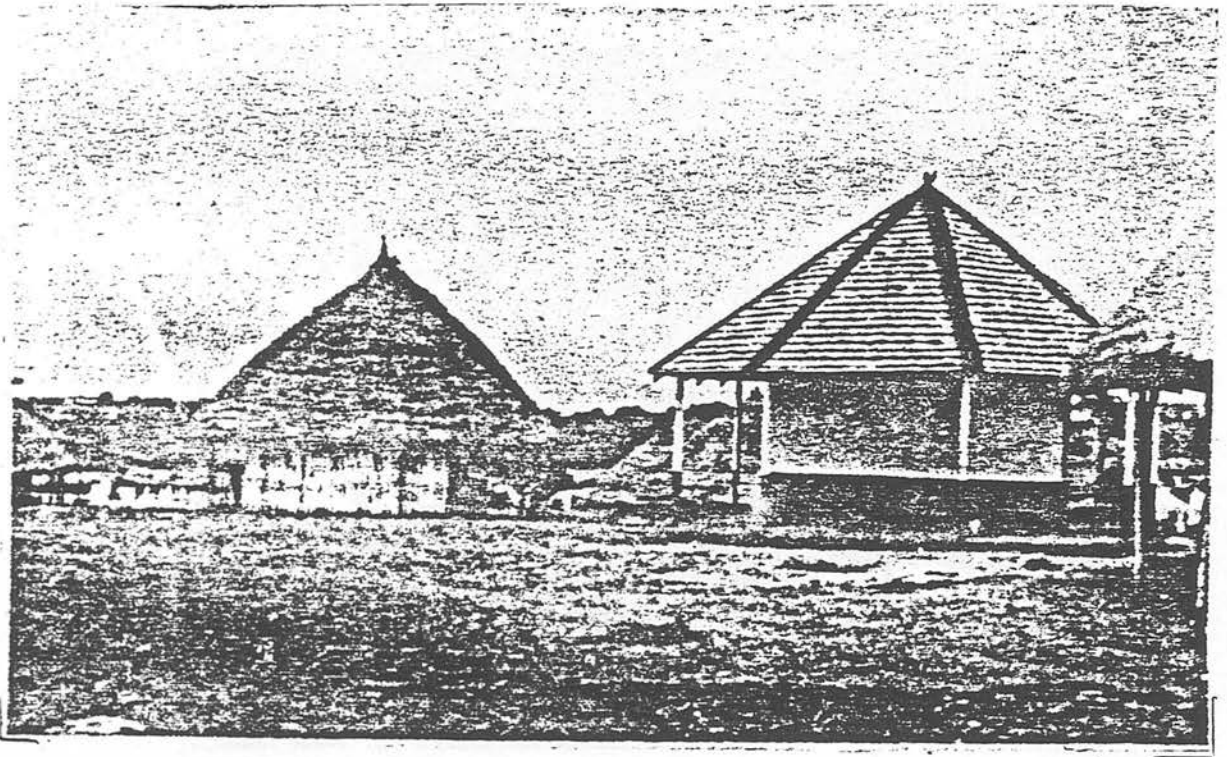


86. Soldiers' round house type - renewing grass thatch.  
West Africa.

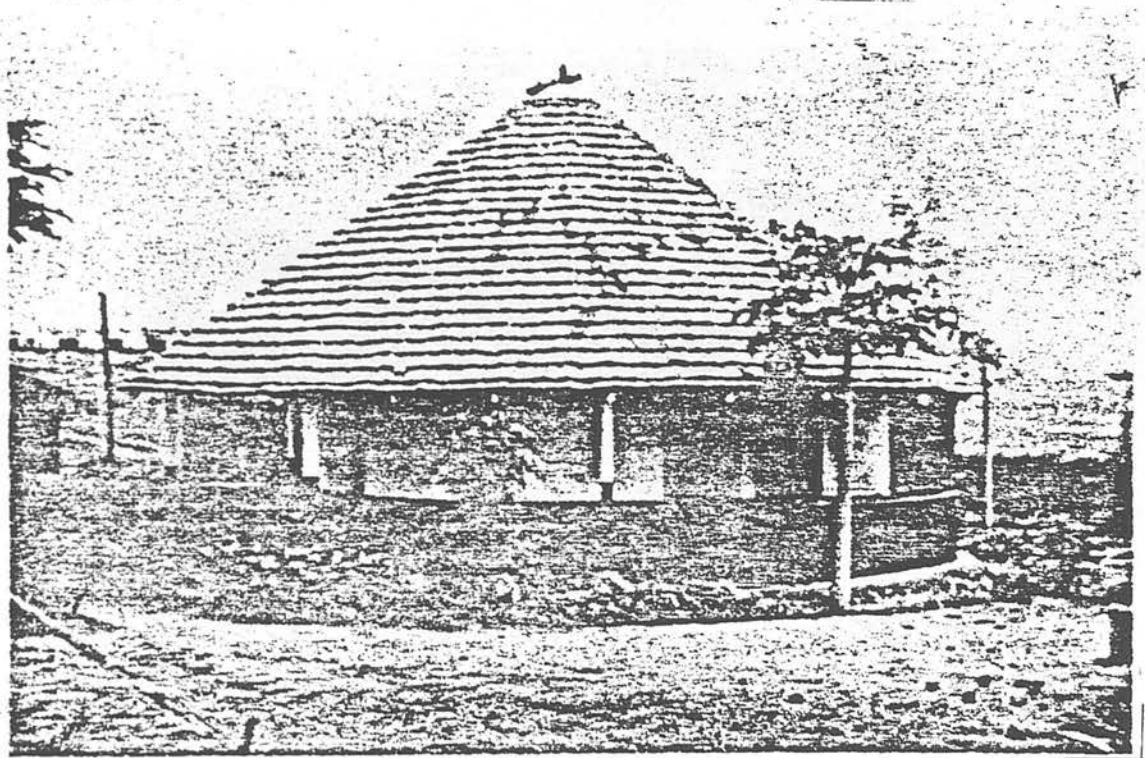


87. Soldiers' dining hall constructed in timber frame with  
grass thatch roof. West Africa (1945).

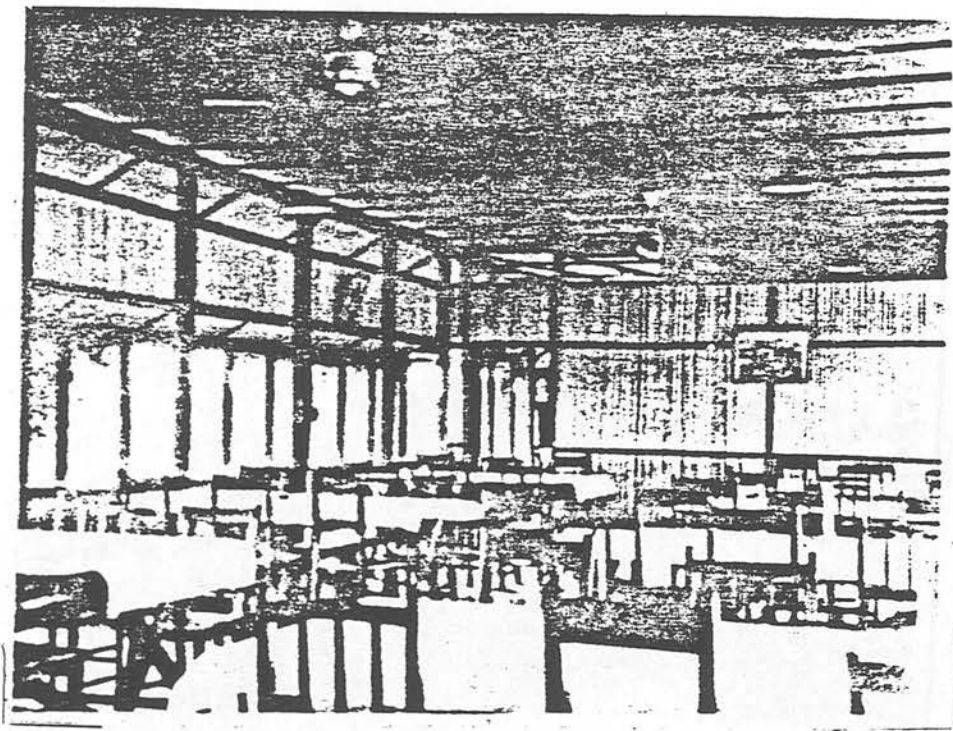




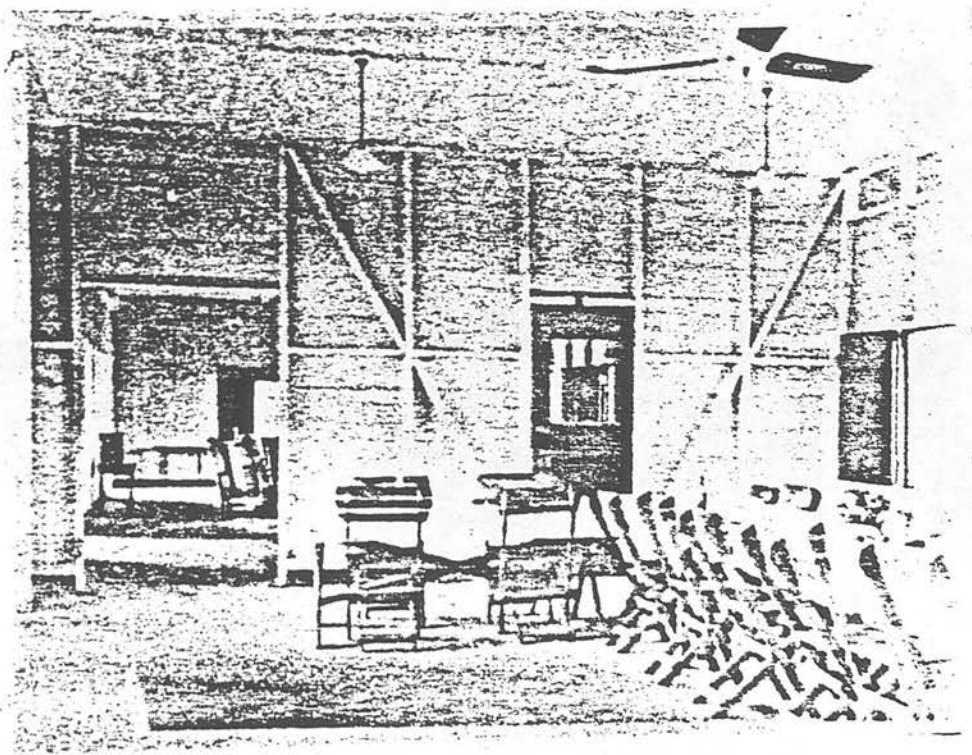
89. Round houses - before and after shingling, West Africa.



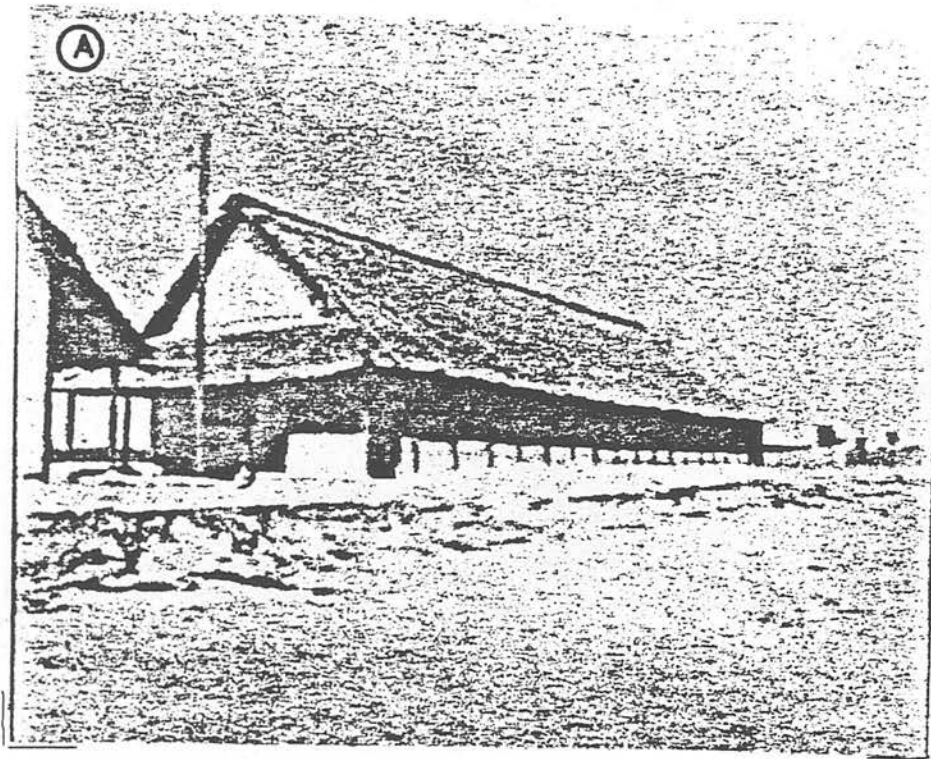
90. Officer's round house with swish walls, bamboo and grass roof replaced with shingles, West Africa.



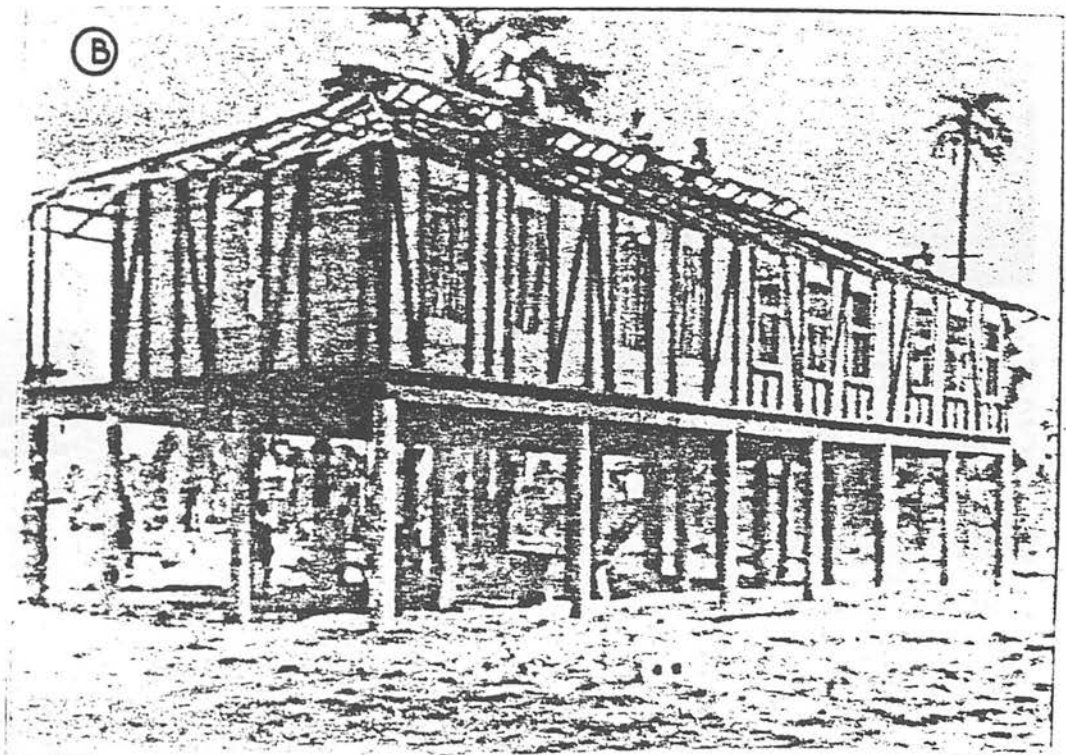
91. Interior of Lagos-type Officers' mess showing tukarua partitions, zana matting ceiling and mosquito proofed verandah with internal windows omitted for coolness. West Africa (1945).



92. A British non-commissioned officers' mess showing Lagos-type framed hutting. West Africa (1945).

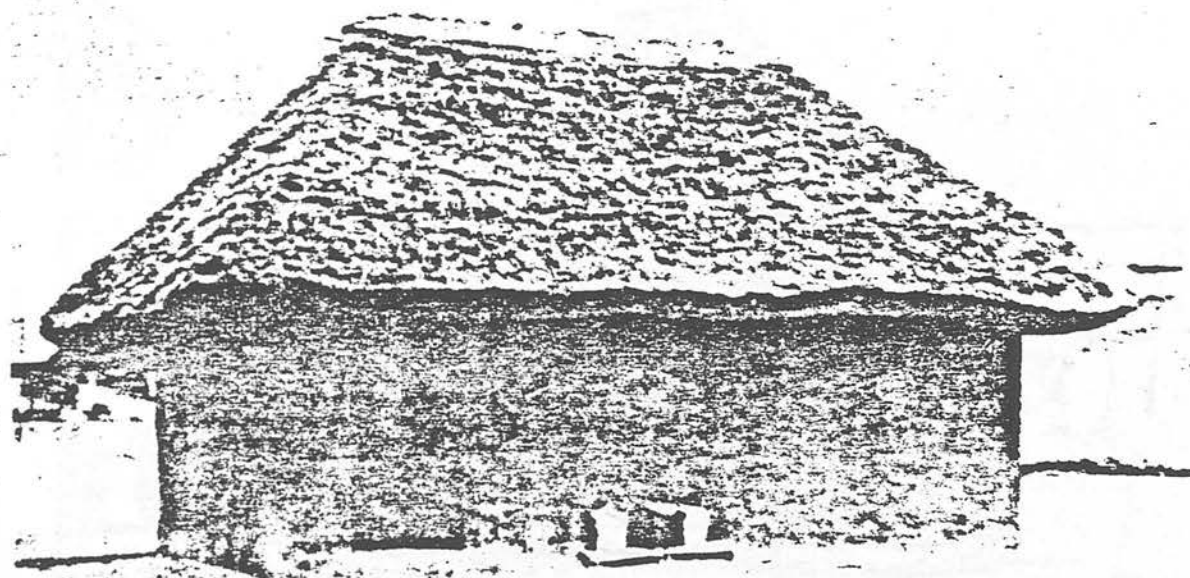


93. An Officer living hut in Gambia showing wattle and daub walls. (1945).

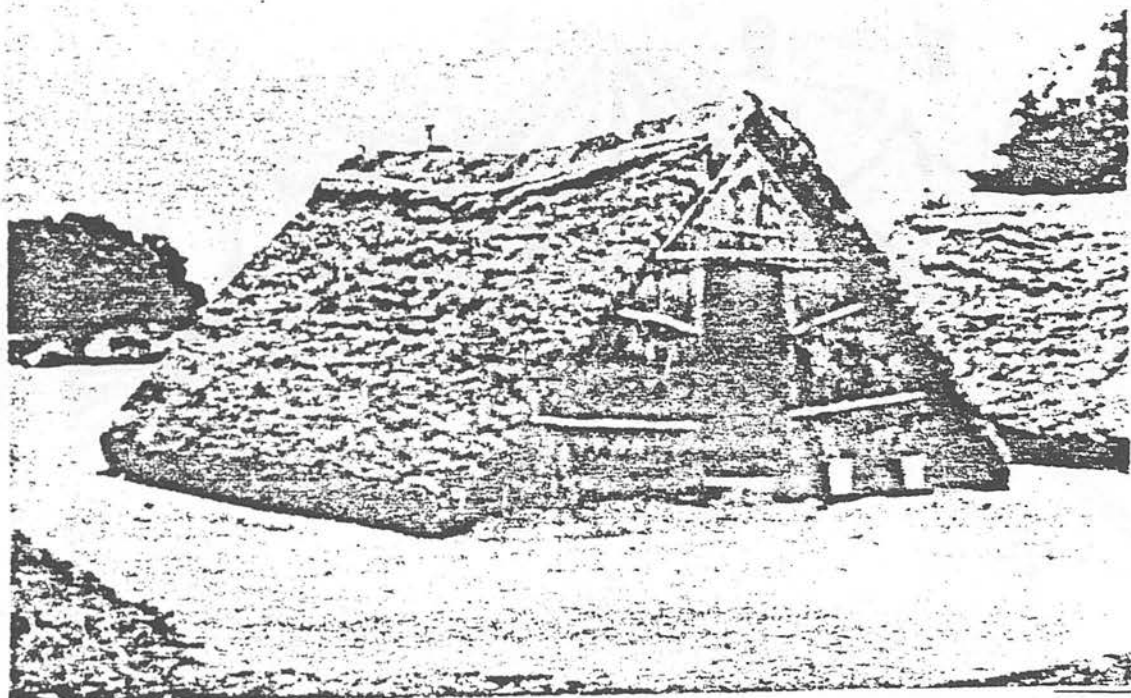


94. An office building in Gambia showing building on rhun palm 'stilts' with split rhun palm framing filled in with wattle to be finished with mud daub. (1945).

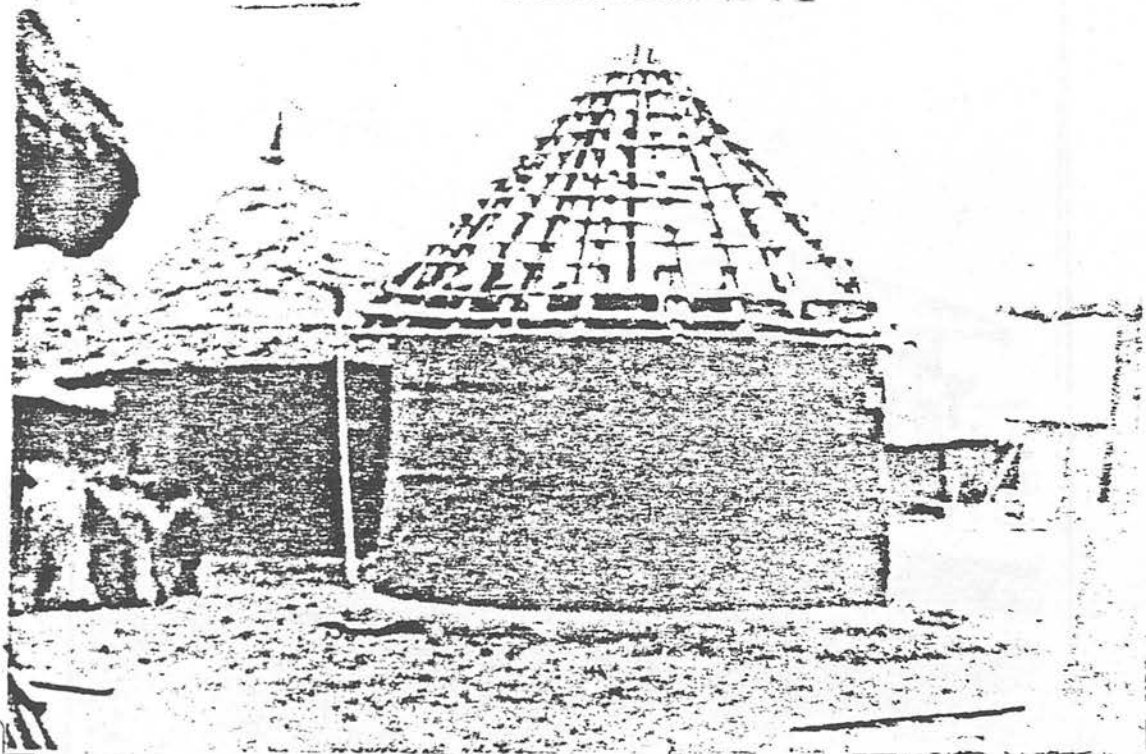




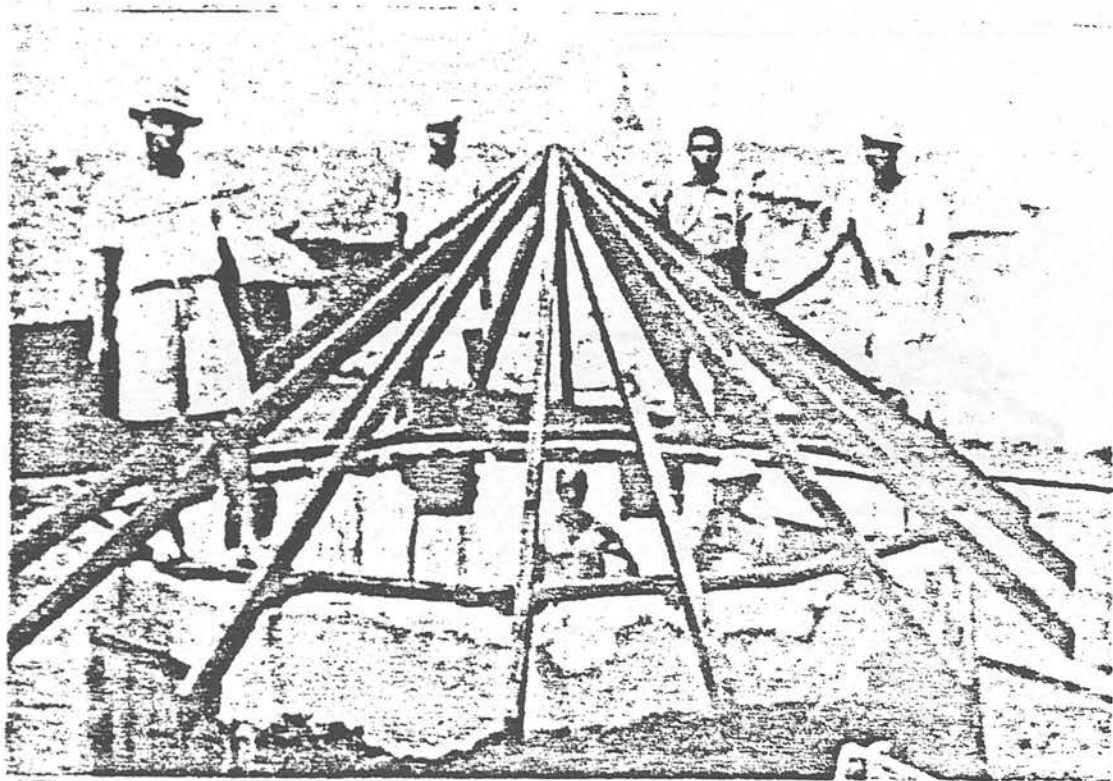
95. Soldiers' rectangular type mud house constructed with swish walls, bamboo and thatch roof. West Africa (1945).



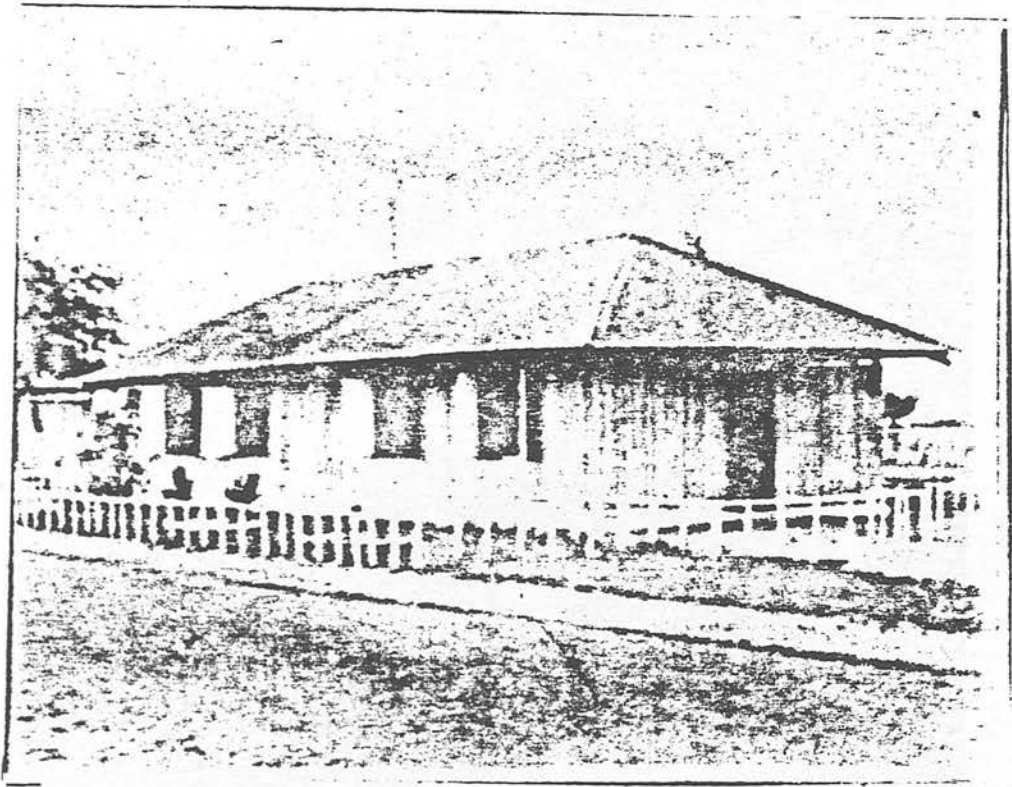
96. Soldiers' old type Ark hut constructed using bamboo frame and grass matting. West Africa.



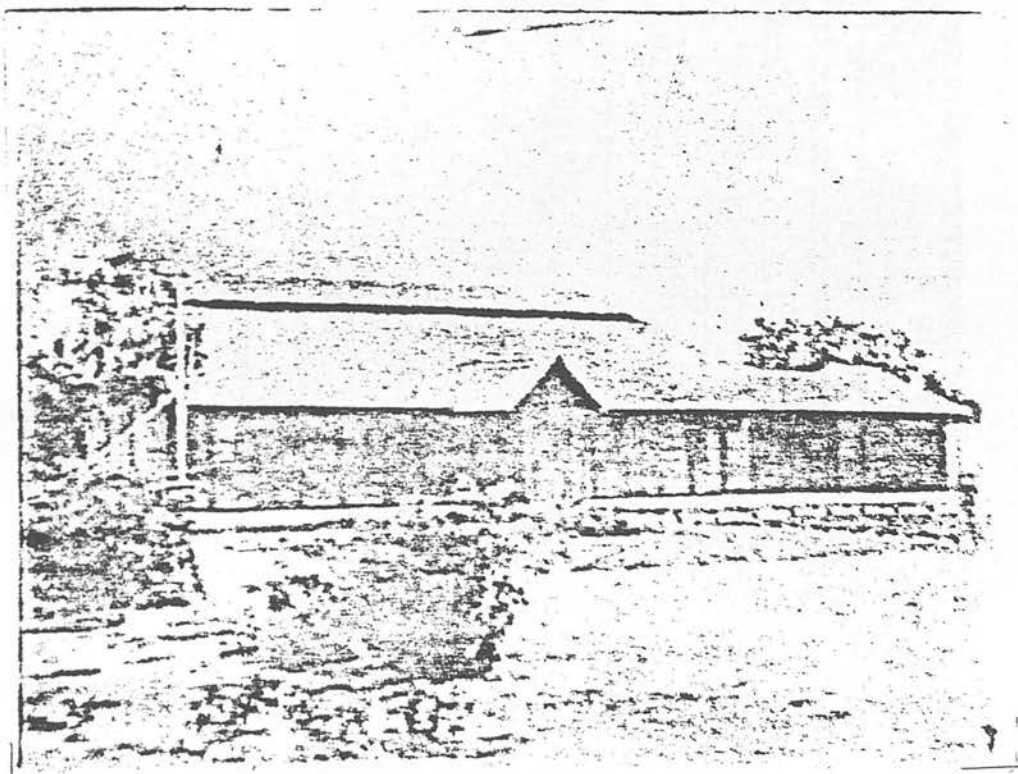
97. Soldiers' round house type with bamboo and grass thatch. West Africa (1945).



98. Soldiers' round house type stripped for new roof.

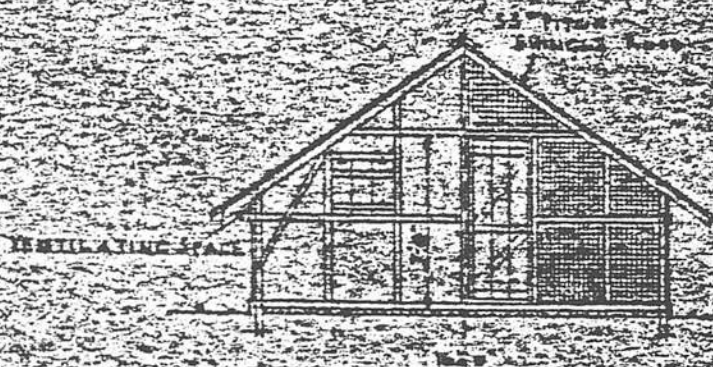


99. Soldiers' quarters in Lagos showing tukarua cladding to timber framing.(1945).



100. Officers quarters in Lagos - Lagos-type hutting showing mosquito lock and ridge ventilation (1945).

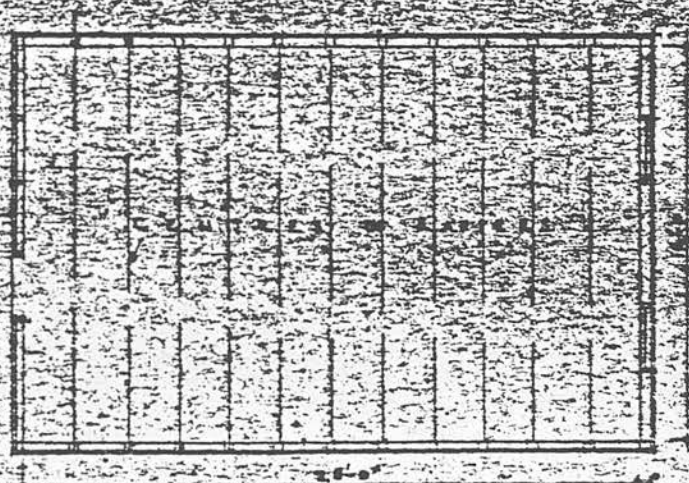




HALF SECTION & HALF ELEVATION

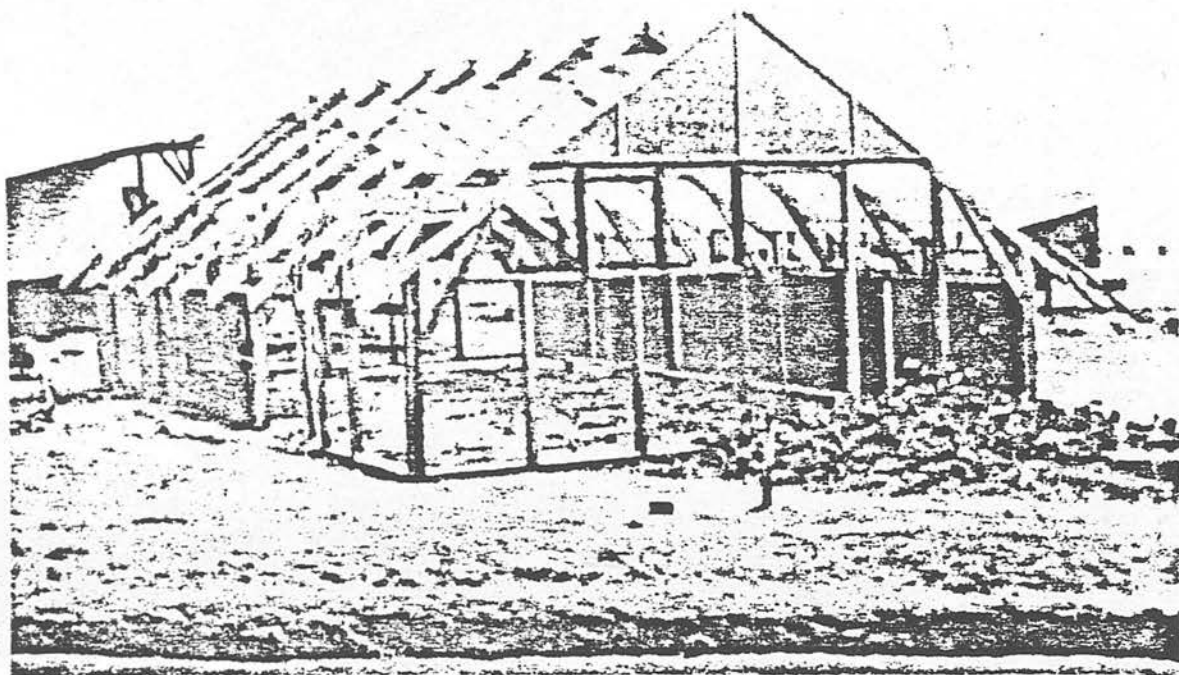


PART PLAN

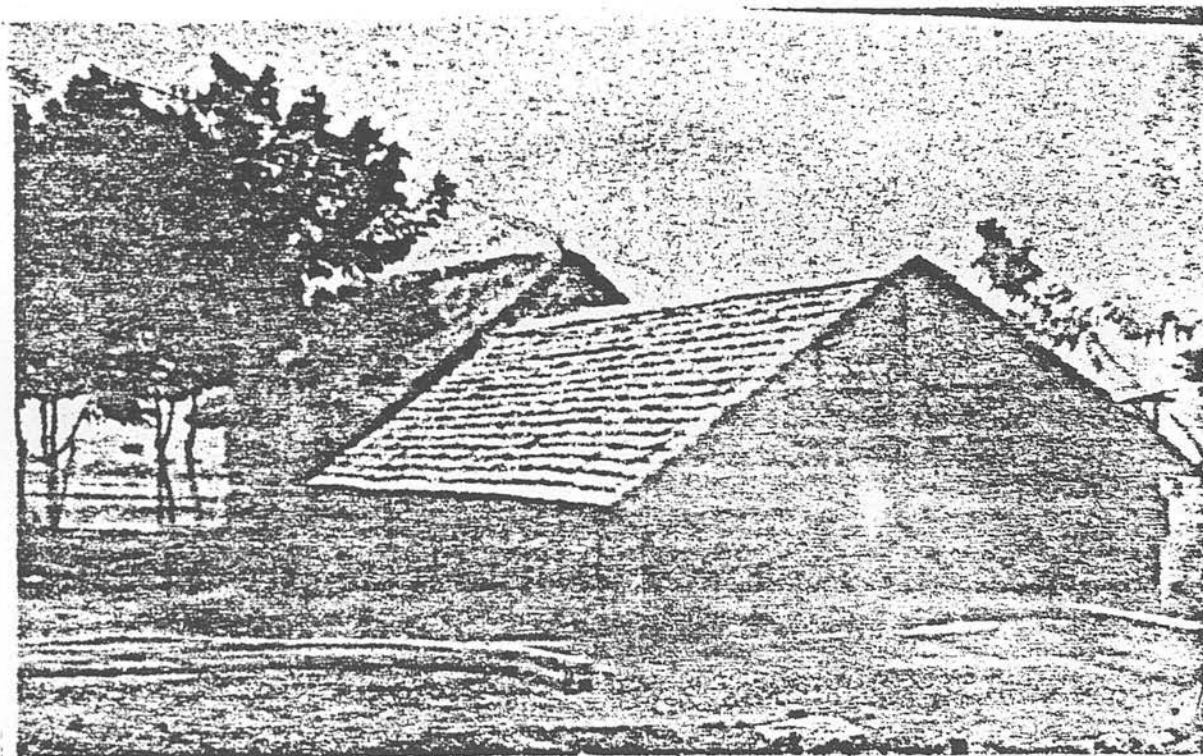


GROUND PLAN

SCALE 1/8" TO 1'-0"

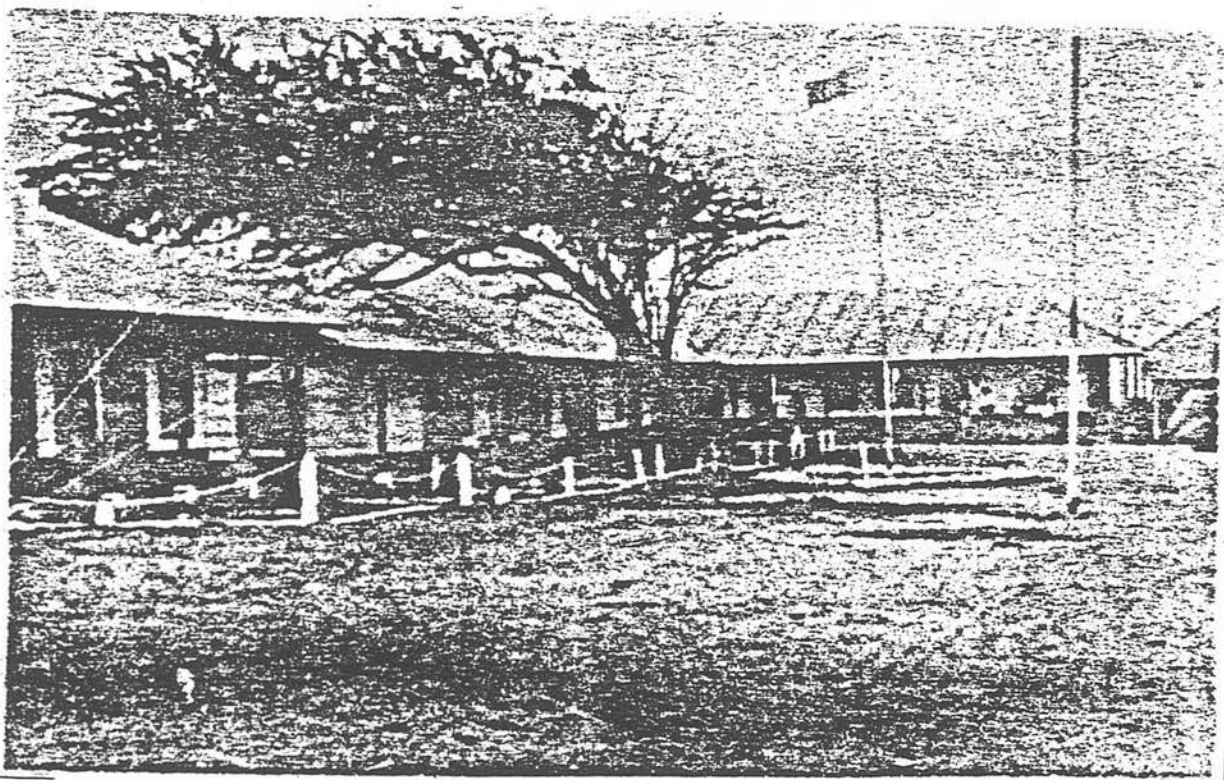


102. Soldiers' Ark type house under construction. West Africa.

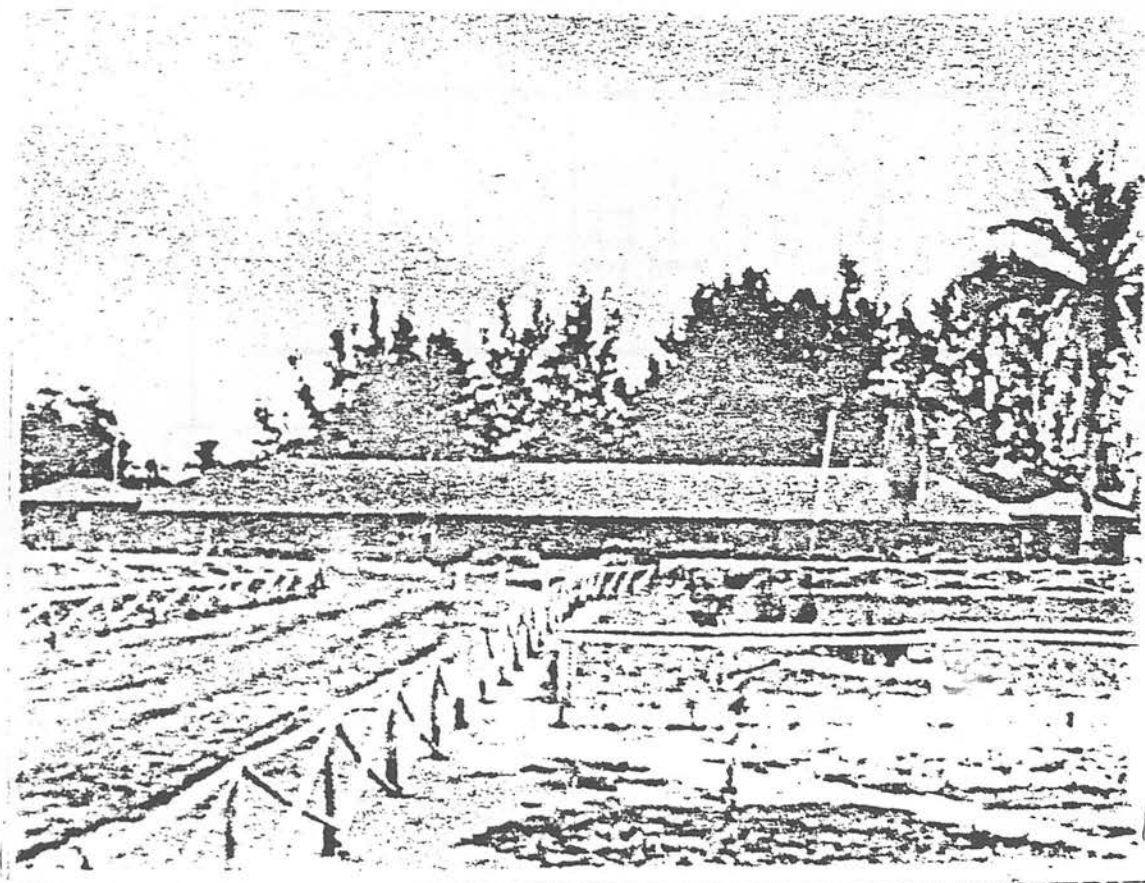


103. Soldiers' Ark type house constructed with timber frame, zebri mat walls and shingle roof. West Africa (1945).



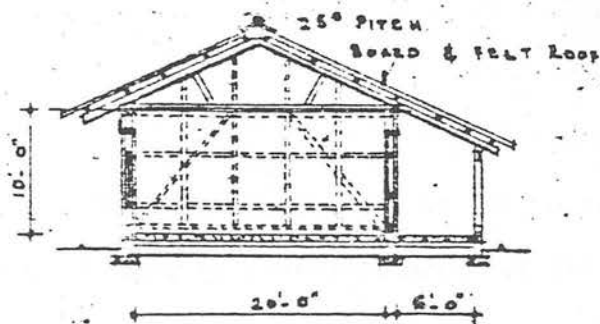


104. Office building constructed with timber showing felt roof treated with cement and lime wash to deflect sun. West Africa.

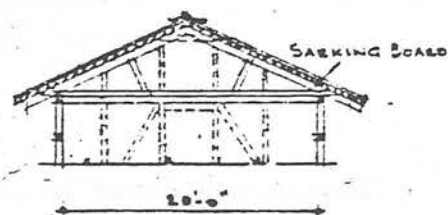


105. Lagos-type hutting used in the construction an Officers' mess in Lagos, Nigeria. (1945).

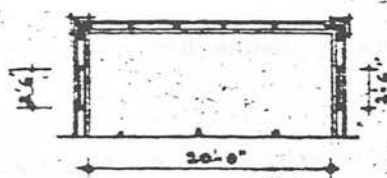




SECTION



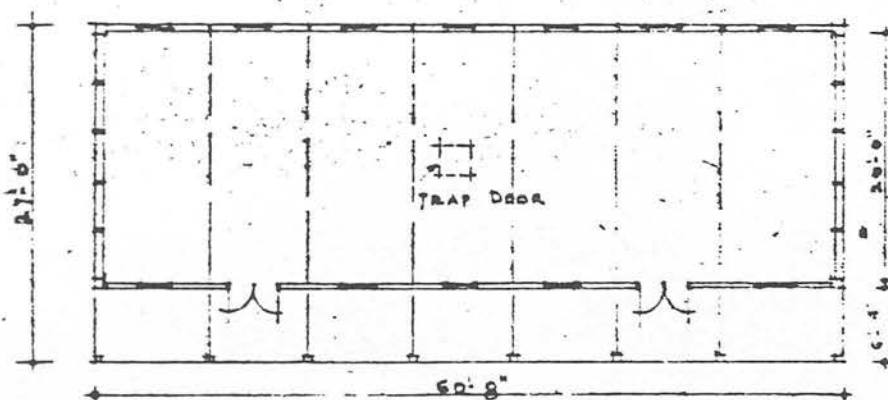
SECTION OF ROOF  
WITH SARKING BOARD



PART DETAIL PLAN OF  
HUT



PART LONGITUDINAL  
SECTION



GROUND PLAN

SCALE 1/16" TO 1'-0"

Following the end of the war, a new order of battle was agreed for the long term establishment of the RWAFF with a command head-quarters at Accra in Ghana. A team was set up by the Chief Engineer to assess the commitment for constructing permanent modern accommodation for the Force in April 1947. Although a comprehensive report was completed, none of its findings were implemented under the British Government as it was overtaken by Independence being given to the four Colonies.<sup>17.</sup>

Situations in individual colonies during this period are briefly looked into in the following paragraphs.

17. Brigadier H.W.Baldwin, Operations and Maintenance of West African Engineers to 1949 Royal Engineer Corps Library, Chatham.

GHANA

a. Accra

The RWAFF Garrison in Accra comprised the Regimental Headquarters of the Gold Coast Regiment (GCR) and a Light Artillery Battery. They were located in the Military Cantonment. The greater part of the pre-World War II Barrack blocks in this Cantonment and those added during the war were of temporary construction. The Cantonment was zoned as a European Residential Area in the post-war Town Planning proposal. The Colonial Government pressed for the early evacuation of the site to a new site where the construction of new Barrack Blocks was to be commenced.

The new site was sited East of Accra township. The site included the areas already occupied by Giffard and Teshi Camps. Giffard Camp was built for the U.S. Army and was constructed in cement block with timber and felt roofs. After the departure of the U.S. Army, it housed the West Africa Command Headquarters, West Africa Signal Regiment, Workshop, and Command Pay Office. The layout was simple and the construction semi-permanent. The Barrack blocks in Teshi Camp were of temporary construction of swish with shingle or timber and felt roofs. It accommodated the West African School of Infantry and the 37 Engineer Field Squadron.

b. Kumasi

Before the War, Kumasi was considered as the Military Centre for the Gold Coast (Ghana). It was the capital of Ashanti and was approximately central for the Colony, Ashanti and the Northern Territories. The Military Barrack stretched along both sides of a main road within the town. The African Barrack blocks and administrative areas were zoned for Civil requirements in the post-war Town Planning proposals. The British soldiers were housed from the Colonial Government Buildings.

c. Tamale

The pre-war Barrack blocks in this location were of temporary construction and were located originally on the outskirts of the town. Due to the expansion of the town, the Barrack blocks were later surrounded on two sides by civil buildings. A new site, three miles radius of the town was proposed for a new Military Barrack.

d. Takoradi

During the War, Takoradi was the second most important port in British West Africa and was one of the largest Royal Air Force stations in the World. The Coques' Fort provide housing for the Artillery Coast battery and the blocks were of temporary construction. The Barrack blocks in Aucott Camp which housed the RAF during the war were constructed in cement blocks with timber and felt roofs.

SIERRA LEONE

a. Freetown

Freetown was a pre-war Imperial station, garrisoned by small units and detachments of various arms of the Military. The coastal defences consisted of armaments at King Tom and Murray-town and a Fortress Company Royal Engineers, at Murray-town. Detachments of Royal corps of Supply, Medical, ordinance and Service were accommodated at Tower Hill. The Sierra Leone Battalion occupied Wilberforce Barrack with detachments at Daru and Makene.

Murray-town Barrack blocks were in permanent construction and were built prior to the war. Tower Hill Barrack was the original Imperial Barrack built in the last century. All the blocks were in permanent construction, but they were unsuitable for modernisation after the war. The Wilberforce Barrack blocks were constructed in timber with corrugated galvanised iron sheet roof.

b. Daru

Daru was a pre-war station for a detachment of the Sierra Leone Battalion. All the Barrack blocks here were of temporary construction.

GAMBIA

The pre-war garrison consisted of a Gambia Company accommodated in stone built Barrack blocks at Cape St. Mary. There was considerable expansion during the war but the force contracted back to a company strength after the war.



## CHAPTER FOUR

### NIGERIA

Nigeria is the largest country on the West African coast, covering an area of 923,737 sq.km. (356,669 sq. miles). It is within the tropical zone between latitudes 4°20' and 13°53' north and between longitudes 2°40' and 14°40' east. The vegetation of the country is divided into three zones. First, the swamp and tropical rainforest of the coastal belt<sup>1</sup>; second, the high forest of the humid south; and third, the Guinea and Sudan savannah of the north.

The climate of Nigeria is conditioned by the seasonal shifting of pressure belts, the continental air masses blowing from the north-east from November to March, which is the dry or harmattan season, while the equatorial maritime air masses blow from the south-east from May to September to create the rainy season. In Zaria the temperatures vary from an average maximum of 35.8°C in April to an average minimum of 14.°C in January. The mean annual rainfall (1928-1967) is 1,110 mm and most of it falls between May and September.<sup>2</sup>

1. R.W.J.Keay, An outline of Nigerian Vegetation (Lagos; 1949) pp 33-36.
2. M.W.Walter, Observation on rainfall at the Institute for Argricualtural Research in Samaru Miscellaneous Paper No.15, (A.B.U. Zaria 1967) pp 3-5.

## NIGERIAN ARMY

Following the disbandment of the Royal West African Frontier Force Command on 1st July 1956, the Nigerian Military Forces became independent of the other Forces that constituted the West African Force, but was subject to the orders of the British Army Council in London until April 1958, when the control of the Force was finally passed over to Nigerians and the Nigerian Tax payers took over the full cost of the Army.

During the period of transition, 1956-1960, the strength of the army was 250 officers and 6,400 soldiers. The Nigerian Officers numbered less than <sup>3</sup>61. The Army consisted of five Infantry Battalions, one each located at Ibadan, Abeokuta and Enugu; while Kaduna had two battalions, an engineer squadron and an artillery battery. Zaria was the location for recruitment and training depot.

The last British Battalion Commander was replaced in June 1963, and all the British officers in the battalions were replaced by Nigerians by the end of that year. In 1964, the British staff officers at Army and Brigade headquarters were replaced except the General Officer Commanding (GOC) the Army, Major-General Welby-Everard, who eventually left in February 1965 and was succeeded by the first Nigerian GOC, Major-General J.T.U. Aguiyi-Ironsi.

The Nigerian Army staged a military coup in January 1966 and took over the control of the Federal Government. It fought a civil war in 1967-1970 and in 1979, handed over the control of Government to a civilian administration. On the eve of 1984, just five years later, the civilian administration was ousted and the Army is once again in control of the Federal Government.

3. Our Military Forces - An account of the Organisation and history of the Nigerian Military Forces, published by the Federal Information Service, Lagos, 1957.

### Organisation

The Nigerian Army, like those of all sub-Saharan African States was first created, organised and trained under Colonial tutelage. Until Nigeria's Independence, all advanced training of Officer Cadets, Senior Officers and Non-commissioned officers was done in Britain and all equipment was purchased there. When vacancies available in the British Institutions were not enough to cope with the training of the increasing number of Cadets and officers, Cadets were sent to Canada, Australia, India, Pakistan and the United States of America, and when Nigeria set up its own Academy for training of officer cadets, it was largely staffed by an Indian training mission, with an Indian Brigadier as Commandant.

In the early years of Independence, the army provided support for the Government, helped to maintain law and order, and provided the ritual marks of sovereignty with military parades, and guards of honour on ceremonial occasions.

By January 1966, the Army had Infantry battalions, organised into two Infantry brigades, with two Reconnaissance (or Recce) squadrons, a Field Battery and a Squadron of Engineers. The Army was thus equipped to do no more than act as guarantor of internal order, to maintain the external boundaries of the Nation and provide a mark of sovereignty. Until the Civil war, it did not have the technology of violence at its disposal (in terms of tanks, artillery and air support) to undertake large scale military operations even of the Second War type; except, as in Congo, when part of an international operation in which the infrastructure was provided by others.

The Army's involvement in government after the 1966 coup, greatly affected its own organisation. The coup swept away by death or transfer into political roles more than half the combat officers who had attained the rank of Lieutenant Colonel and above, and two of the army's three Brigadiers.<sup>4</sup>

By the end of the civil war in 1970, the strength of the army had risen from about 10,000 men just before the war, to over 200,000 men organised basically into four Infantry Divisions. This unpremediated increase in size, resulted among other things, in a phenomenal spread of units all through the length and breadth of the country and a serious lack of accommodation, training and equipment. The officers' corps expansion was met by large-scale promotion of Non-commissioned Officers (NCOs) from the ranks, and by three to four months crash courses at the Nigerian Military Training College (NMTC) Kaduna, for cadets of suitable educational qualification. It is undoubtedly true that this expansion diluted the professional quality of the officer corps.

In the years after the civil war, the Nigerian Army underwent numerous organisational changes to conform with its objectives, the acquisition of sophisticated weapons and its requirement for more skilled and technically oriented personnel. It now has four Divisions; two mechanised, one armoured, and one multi-arm. It also has a Brigade of Guards for ceremonial and security duties in the Federal Capital.

Each of the Divisions consists of three Brigades, and each Brigade three battalions or equivalent. The battalion consists of five companies; three mechanised, one support, and one administrative.

4. Brigadier David M. Jemibewon, A <sup>C</sup> Bombatant in Government,  
(Ibadan: Heinemann, 1978) pp. 3-20

The mechanised companies are organised into three platoons and the platoons into 3 sections of about ten men each.

Pre - 1956 Barrack Housing

During this period, the Nigerian Regiment, for the purpose of accommodation, was treated as part of the Royal West African Frontier Force. All Barracks before World War II were provided by the Colonial Government and built and maintained by the Public Works Department. The Royal Engineers came onto the scene at the outbreak of the war.

All Nigerian Barrack housing and administrative buildings, with rare exceptions, were constructed in swish or in timber. Roofing was of grass thatch or corrugated iron. The method of construction had been governed almost entirely by the climate and availability of local resources. Thus in Northern Nigeria where the climate is hot and dry, the round houses were built in swish with grass roofs. Each was occupied by one soldier and his family. In the central and southern parts where rainfall is moderate the majority of the Barrack housing were built in swish but the exterior walls were rendered with cement, and the roofing was corrugated iron. The Barrack blocks were designed in long rectangular buildings divided into a series of single rooms each housing a soldier and his family. Latrines and ablutions for the lower ranks were communal but each quarter had its own kitchen. During the war, due to the sudden expansion of the RWAFF, temporary Barrack housing were built in various locations to accommodate the new units. Most of these units were however disbanded after the War. Due to the shortage of more permanent building materials (which were mostly imported), funds, and lack of adequate skilled manpower, the accommodation situation did not improve much after the War. Plans were made, but were overtaken by events, such as the Independence of the colonial territories which automatically switched the source of funds and the control of the forces to the new Governments in the territories.



The British Soldiers' Housing during this period may be divided into two categories. Firstly, there were those locations where Military personnel were treated as Colonial Servants and were allocated civilian bungalows, and secondly, where quarters were built to meet RWAFF demands. Some locations contained a combination of these. It should be noted that the Colonial Governments housed their staff without differentiation between married and unmarried officers. The accepted Government policy before the War, which still obtained after the War, was that West Africa was not a station suitable for children.<sup>5</sup> Thus, Public Works Department (PWD) designs allowed for one bedroom only per quarter except in the case of heads of departments when an additional room was added for accommodation of guests. Officers and warrant officers were given bungalows equivalent to their civilian counterparts but as there was no civilian counterpart to the sergeant, special quarters were built for him. These consisted of semi-detached buildings, each half being self-contained with bedroom, boxroom and lavatory. In some locations this accommodation was provided in a block of rooms with the sanitary accommodation at one end of the block. While in some Northern stations they were provided in the form of round swish huts with equivalent amenities.

5. Haywood & Clarke, History of RWAFF p. 484

In addition to the problems of funds, materials and inadequate skilled manpower, some of the temporary Barrack housing during the War, which still provided accommodation for some units after the War, were erected on land requisitioned from private owners. The lease to this land was to expire on the 31st December 1947.<sup>6</sup>

Rapid development was taking place in the West African Colonies and in 1944 under the Colonial Development and Welfare Fund organisation, Mr. Maxwell Fry, with a team of town planners, came to West Africa as Town Planning advisers to the Resident Minister. During Mr. Fry's tour, Town Planning proposals were prepared for all the main towns in British West Africa<sup>7</sup> and this included the majority of the Military stations.

In many instances the RWAFF took over the initial control and administration of areas previously ruled by unfriendly and warlike Chiefs. Hence it was quite usual to find that the Barracks were among the first, if not the first, buildings to be erected in the townships. With the progress in trading, the towns developed around the Barracks, usually with the native township near the Nigerian Soldiers' Barrack housing and the European residential areas near the officers' and British Soldiers' quarters. In all these cases, under the Town Planning proposals, the areas occupied by the Military was zoned for other purposes and it became necessary to find alternative sites outside the town boundaries.

6. Post War Planning - West African Command Prepared by the OCRE (Office of the Chief Royal Engineer) West Africa Command Accra (1947 )

7. The Economic Programme for the Federation of Nigeria 1955-1960 (Lagos: Federal Government Printers' 1955) p.14

The amount of pressure brought by the Colonial Governments for the military to vacate these sites varied with individual stations and even with individual unit locations within the stations. The military stations in Nigeria during this period were few considering the number at this present time.

a. Lagos

The pre-War strength of Lagos garrison was one Infantry company housed in Ikoyi Barrack. Considerable expansion of the garrison took place during the War and temporary Barrack housing were built to accommodate the expansion. They were long rectangular buildings, built in cement blocks with corrugated iron roofs and divided into a series of single rooms for the soldiers and their families.

b. Kaduna

Kaduna was a pre-War RWAFF station and the majority of buildings occupied were Colonial property originally allocated for RWAFF Barrack housing and offices. Mogadishu Barrack which accommodated the 1st Battalion was situated almost in the centre of the town. It consisted of rectangular blocks constructed with cement blocks and round mud huts. Brompton Barrack was eight kilometres North of Kaduna town and provided accommodation for the 5th Battalion. Temporary war time Barrack housing built in switch were also located in Brompton. The artillery battery was in the York Barrack, while the Military Hospital was in Balfour Barrack.

c. Zaria

Zaria was another pre-war RWAFF station where the majority of the buildings occupied were Colonial property originally allocated to the RWAFF.

These were mostly of temporary construction (swish). It provided accommodation for the recruit training depot and the physical training centre. Under the town planning proposals the site was required for development of the native township. However, the military saw no military justification to move elsewhere and therefore retained the site. The Boys' Company (now The Nigerian Military School ) was built to the east of the recruit training centre. The buildings were constructed of cement blocks and corrugated iron sheet roofings. The rebuilding of the temporary construction, though considered necessary, was not to be carried out until such reconstruction became necessary through deterioration of the buildings. It was therefore placed on very low priority in the post-war plan.

d. ENUGU

Enugu was also a pre-war RWAFF station. It consisted of the 4th Battalion, Light Aid Detachment, Detachment of command stores depot and a detachment of the Nigeria Signal Squadron. They were all accommodated in Martinique Barrack, the buildings of which were in temporary construction. The military retained the site. The rebuilding of this Barrack was of low priority in the post war plan of the West African Command.

e. IBADAN

Ibadan was a pre-war station of battalion strength. The unit occupied M'Bungo Barrack, the buildings of which were in temporary construction. During the war Ibadan was extended considerably and included the construction of a hospital known as Keswick Barrack.

It was proposed that a new battalion accommodation would be built there to accommodate the battalion (2nd Battalion) which was then at Abeokuta. The complete rebuilding of the M'Bungo Barrack was of low priority on the post war plan of the West Africa Command.

f. JOS

There was a Command leave station in Jos, on the Plateau.

It was constructed in swish with grass roofs and there was adequate accommodation for 12 unmarried officers and 24 British Soldiers.

In the post war plan, it was proposed to be rebuilt in permanent materials on its site and the accommodation was to be designed on an economical hotel scale.

Post - 1956 Barrack Housing

Among the main points of agreement reached during the West African Forces Conference held at Lagos in 1953, was that Nigeria became responsible for the whole cost of military capital works and the maintenance of military buildings. This led to the formulation of a ten-year building programme for the military. The implementation of this programme was slow, funds were not made available and progress hindered by shortages of staff in the Public Works Department. As the members of the House of Representatives pointed out, and Ministers admitted, the accommodation provided for the Police was far superior to that of the Army.

The first five years of the programme, 1955-1960, included such schemes as the provision of Barrack Housing for both officers and men, and the removal to new sites of certain units accommodated in areas required for development of civilian housing schemes.<sup>8</sup> A large part of the allocation was absorbed by maintenance and reconstruction of semi-permanent or temporary buildings pending their replacement by permanent ones. The construction of a Command Headquarters in Lagos was not included in the programme, but it was built as a result of the dissolution of the West African Command Headquarters with effect from 1st July 1956, and the consequent need to set up an equivalent Headquarters for Nigeria alone. The quarters built were mainly those for the specialist arms, who had no military quarters. A Nigerian private soldier, if unmarried, shared with two other unmarried privates, a room of 11 sq. metre of floor space; that is to say each unmarried private had 3.7 sq. metres.

8. Economic Programme 1955-1960 P.15



For the unmarried soldiers, messing was on a communal basis. A married private had a room of 11 sq. metres of floor space and a kitchen of 2.5 sq. metres. Sanitary and washing facilities were provided on a communal basis. Apart from the Mess and one or two football pitches, there were no other social, community or recreational facilities provided within the barracks.

After the country's independence in 1960, a vigorous attempt was made at improving the living conditions of the soldiers particularly in the infantry battalions where they were still in mud and timber frame huts. A former minister for Defence, Alhaji Muhammadu Ribadu, in presenting a motion before the House of Representatives, to enable more money be voted for military construction made reference to the Barracks "... Our inheritance consisted by and large in a lot of temporary buildings and mud huts..."<sup>9</sup> Over £10 million was expended on the building and rebuilding of army Barracks during the first four years after independence<sup>10</sup> as against £1.582 million in 1955 -60 economic programme.<sup>11</sup> The new buildings were two to three storeys high, with two unmarried privates sharing a quarter of two rooms, each nine square metres, and the married taking the whole of the two rooms. The sanitary and kitchen facilities were at the ends of each floor. Messing for the unmarried was still communal.

9. House of Representative Debates, 18 March 1963 (Lagos: Federal Government Printers, 1963).
10. Report of Accountant General, 1960-66 (Lagos: Federal Government Printers, 1966)
11. Economic Programme, 1955-60 p.9.

This effort by the Government at improving the living conditions of the soldiers must have given boost to the morale of both officers and men. They were disciplined. It is true that most of the soldiers could not communicate effectively in the English language but this did not inhibit the traditional military courtesies. A private soldier, always smartly dressed and turned out, never failed to pay compliments to another private soldier whom the former or latter as the case may be, knew was his senior either by regimental number of enlistment, or by date of enlistment or both.

The effort, however, came to an abrupt end when in 1966, the military took over the rein of government and the subsequent 1967-70 civil war which brought about the meteoric rise in the strength of the army. After the war, the army was faced with the task of accommodating the new units. Since there was not sufficient accommodation within the existing Barracks, it resorted to the acquisition of civilian houses for the officers and men, as well as for offices. Officers' messes and the Warrant Officers/Sergeants' messes became situated in rented buildings within the civilian communities. In locations where there were not enough houses to rent, timber frame huts were built to accommodate offices and living quarters for both officers and men, in available areas within existing Barracks irrespective of their effect on other buildings and those using them. The result of this high density within the Barrack was the creation of slums. Numerous clashes between soldiers and civilians occurred in towns. The maintenance of morale, military discipline, esprit-de-corps, training and the movement of troops became difficult as a result of the dispersal of the men.

These were aggravated by the army's lack of adequate means of transportation for its officers and men who lived in different parts of the town. Living within the civilian community affected the life style of the soldiers, which was emphasised by the fact that the bulk of them had been recruited during the war and had only a few weeks training before being sent to the front. They had never experienced peacetime soldiering which would have enabled them to acquire the military life style. Quartering them in the midst of civilian communities immediately after the war did not in any way help them to get to know the profession to which they belonged.

In an effort to stamp out all these anomalies, the Military Government embarked on a massive Barrack Development programme in 1971 aimed at providing Barrack accommodation for every soldier before 1976. Unfortunately, not a single barrack project was completed by 1975. As Brigadier Jemibewon observed, "... the administration of the army was stinking with gross inefficiency and mismanagement. Thus while the public were becoming restless with the administration, the army itself was fretting and beginning to complain aloud about the unsatisfactory situation in the army in particular...."<sup>12</sup>. Matters had deteriorated to a point where many members of the junior ranks had to buy uniforms with their own money because those supplied officially were of inferior quality. Yet it was common knowledge that the money voted for the uniforms was intended for material of superior quality. It therefore came as no surprise when a new Military Government was formed on 29th July 1975.

This new government embarked on the demobilization of a large part of the army, took concrete steps to reorganise the rest and placed Barrack Development on its priority list.

12. Brigadier David M. Jemibewon, A Combatant in Government (Ibadan: Heineman, 1978) pp 21-36.

It aimed at returning all soldiers to barracks by October 1979, the targeted day for the handover of the Federal Military Government to a civilian administration. In pursuance of this objective, it created a special task force to handle the development of barracks all over the country. In launching the Task Force, the former Chief of Army Staff (Lt.Gen.T.Y.Danjuma) reminded them "... most of the former projects undertaken were either delayed or never successfully implemented because wrong and incompetent contractors were chosen to handle the jobs....<sup>13</sup>

The Task Force composed of architects, quantity surveyors, engineers, etc., prepared standard plans which were used in all locations irrespective of their situation. This lack of initial analysis of the problems in Barrack Housing and lack of information on the Soldiers needs by the Task Force could be attributed to the provision of an inadequate brief; the non-availability of necessary data and the shortage in time due to the pressure from the army authority, who urgently wanted somewhere to put their men in order to ease the strained civil/military relations. The military, however, should take full responsibility for this because of their inadequate planning. The pre-civil war army was basically infantry, a significant proportion of the officer's career was involved in training and leading small unit commands. The officer was trained as a commander, which requires a combination of heroic leadership and military management.

13. SOJA, A news bulletin of the Nigerian Army, vol.2 No.4, April 1977.

The typical officer came to realise that the desired qualities of military management are those of initiative, improvisation, and the taking of responsibility. His professional goals are based on his military training and background. He was not trained in profit-making or high-level administration. According to Janowitz, "the absence of extensive staff planning limits officers' experience in high ministerial responsibility, strategic planning or innovation - either organizational, economic or political".<sup>14</sup> In pre-civil war years, the central staff military planning in the Nigerian army was limited, and the proportion of trained staff officers very low. The army realised this and set up an Army Command and Staff College, which turned out its first set of graduates in November 1976. They included most of the senior officers at that time.

As mentioned earlier, these new barracks have not incorporated the changes within the army. They are rigid and inflexible for future changes. The space allocation per soldier is still the same as that of the period before the war irrespective of the increase in the individual soldiers' family and his property. Most of the Barracks though located far away from the civilian community are not planned to have adequate community facilities now or the future. Soldiers have to travel a considerable distance in order to make use of those for the civilian communities and the transportation system is inadequate.

14. Morris Janowitz. The Professional Soldier (New York: Free press 1960) p.201.

## BASAWA BARRACK - AN EXAMPLE

This is one of the recently built Barracks in Nigeria.

Accommodation was planned for an infantry battalion on a site seven kilometres north of Zaria town. The battalion was formerly accommodated in temporary structures, with the officers and some of the men living in rented accommodation in different parts of the town.

The design, prepared by the Barrack Development Task Force, was the standard design for an Infantry Battalion Barrack, used in all locations where new Barracks were erected. The construction took approximately three years (1977-1980). By the time the construction was completed, the Infantry Battalion had been re-organised into a Mechanised battalion. This meant the acquisition of more sophisticated equipment and the subsequent reduction in strength of the battalion. A unit of the military police also moved into the Barrack during this period. Inevitably, these actions had an impact on the barrack environment: the mechanical transport yard built for the infantry battalion became too small for the number of vehicles and was not adequately equipped to maintain them. Consequently, the buildings within the yard had to be adjusted and the area designated as play field for the primary school was converted into a vehicle park. This was the result of a rigid design which left no room for expansion. Though the mechanised battalion and the military police had less number of officers than their respective establishments, the accommodation within the Barrack was insufficient for the combined number, so that some officers had to stay in rented accommodation in the town.

In 1982, the mechanised battalion was replaced by an artillery unit. The artillery guns, of course, had no store in the barrack, therefore gunsheds had to be built on an open space adjacent to the converted vehicle park.



### Site

The 50 hectare (0.5km x 1km) site, most of which falls gently southwards, has scanty vegetation with a few trees scattered around. It is bounded by the old Zaria-Kano road to the east, by a stream to the south, by Basawa village to the north, and on the west by a wide expanse of uncultivated land. The site being about three hundred metres above sea level, is an exposed one and strong cold Harmattan winds blow continuously during certain periods of the year.

### Planning and Layout

The layout of the buildings follow a rigid grid pattern which has left little or no room for expansion. The arrangement of the living accommodation is thus a constant reminder of the parade ground. The officers' quarters are sited to the north, the junior ranks' accommodation form the boundary to the west and south, while the Warrant Officers' and sergeants' accommodation are sited almost at the centre. The administrative buildings are close to the entrance gates at the east end. The Roman Catholic chapel, the Protestant chapel, and the Mosque are all located to the North of the warrant officers' and sergeants' quarters. Between these religious buildings and the officers' quarters lie the officers' mess with accommodation for single officers.

There are three gates into the Barrack, the south gate leading to the junior ranks' quarters, the middle gate to the administrative offices, while the north gate leads to the officers' quarters.

The primary school is located to the south of the warrant officers' and sergeants' quarters.

The scale of the buildings is generally domestic and they are predominatly one storey. The limited range of material and consistency of detailing serves as a unifying factor. However, no attention has been paid to the landscape or planting in the Barrack. Open spaces between buildings are uncared for and some have become rubbish dumps. The barrack has a perimeter wall fence.

#### Domestic Accommodation

The residential buildings, consisting of the officers' quarters, officers' mess, warrant officers' and sergeants' quarters, warrant officers' and sergeants' mess and the junior ranks' quarters are located on the north, east, west and central parts of the Barrack respectively. Architecturally, the buildings and groups of buildings assume a simple domestic character with the same pattern of pitched roof to achieve an overall consistency of form and design. The roofs are covered with lightweight corrugated asbestos roofing sheets. External finish on the walls are tyrolean spray in natural cement colour. The walls are built of hollow concrete blocks with louvred windows in all buildings.

Car parks have been provided for officers in their individual quarters. Only a few soldiers own motor cars, while some have either motor cycles or bicycles for which no parking provision has been made either centrally or individually. Pedestrian routes have not been delineated, although most people are pedestrians.

#### Officers' Mess

The officers' mess located south of the Officers' quarters is seperated from it by the road leading from the north gate.

It comprises the main mess building and semi-detached buildings to accommodate twelve unmarried officers. They are to the west of the main building and are separated from it by a road. Each block consists of two identical living quarters. (fig.108). Each quarter has a car-port, one bedroom - 3m x 3.6m, one living room - 3.6m x 4.8m and a toilet - 1.8m x 2.0 m with wash hand basin, WC and bath. No provision is made for wardrobe or any storage facility. Officers who stay there are expected to eat in the officers' mess, so there is no provision for cooking. However, the space left as lobby in the design (between the toilet and sitting room), has been turned into a mini kitchen by most of the present occupants, some of whom are married.

The main mess building is a U-shape with an open paved yard in the middle. In it are the public rooms comprising the ante-room, lounge, bar and dining room to accommodate the total battalion establishment of 33 officers. It has two tennis courts located on the south side of the mess building. The units share the mess, though the combined number of officers is far greater than was originally envisaged. It has no facilities for the families of the officers.

#### Warrant Officers' and Sergeants' Mess

The site is on a fairly level ground immediately to the north of the warrant officers' and sergeants' quarters and south of the line of the religious buildings. The building plan is similar to that of the officers' mess. It is however smaller in size despite the fact that there are more warrant officers and sergeants than officers in a battalion establishment.

It comprises a dining room, bar and lounge. There is no sleeping accommodation and the only entrance to the building is through the north side for both public and service purposes. No provision has been made for a car park. There are no recreational facilities for the families of the group. One of the warrant officers refers to it as a "beer parlour" because, according to him, those who frequent it only go there to consume alcohol.

The character of the building is simple domestic like every other building within the Barrack. The building is finished externally, with materials similar to those used in the officers' mess. i.e., tyrolean spray and lightweight corrugated asbestos roofing sheets.

#### Commanding Officer's Quarters

This detached bungalow is located in the north of the barracks, west of the officer's quarters. It consists of a built-in garage, a separate dining area, a living room, a study or guest room with toilet, a kitchen with store, one self-contained master bedroom, two other bedrooms and a paved courtyard. All the bedrooms have built in wardrobes.

#### Married Officers' Accommodation

These are detached bungalows sited on the north-east part of the barrack. There are access roads to each bungalow. They are arranged in rows with eighteen metres between each building and twenty metres between each row. Each bungalow consists of a car port, a dining /living room - 4.2m x 9.6m, a kitchen with store - 4.2m x 4.2m, one master bedroom with its own toilet - 4.2m x 6.6m, two other bedrooms - 4.2m x 4.2m each, a shower room with wash hand basin - 1.5m x 3.0m and a W.C. in a separate room - 1.2m x 1.5m.

#### Warrant Officers' and Sergeants' Accommodation

The warrant officers and sergeants are accommodated in semi-detached blocks. (fig.109). Each soldier of that rank, whether married or unmarried, has a sitting/dining room - 3.6m x 5.4m, a kitchen - 3.0 m x 2.1m one toilet with shower, WC and wash hand basin - 1.8m x 2m , and two bedrooms - 3.6m x 4.1m and 3.6m x 3.6m.

The blocks are 14.4m x 9.0m each and are arranged in rows with 7.5m between each building and 10.0m between each row. A few of them have cars but no provision is made for a car park there. This group of buildings is located in the central part of the barrack.

#### Junior Ranks' Accommodation

These buildings occupy more than half of the total site, at the west and south ends of the barracks. The blocks are approximately 47.0m x 11.0m each (fig.110) and are arranged in rows with 15m between each building and 20m between each row. The spaces between these blocks are empty except for a few trees that were not destroyed during the construction.

Each block has accommodation for 12 soldiers. The soldier, whether married or unmarried occupies a quarter with one bedroom - 3.1m x 3.5m, one sitting room - 3.1m x 3.5m, a kitchen - 1.8m x 1.9m, a toilet with shower, WC and wash hand basin - 1.8m x 1.9m. The kitchen door and the sitting room door both open to the outside. There is a door joining the sitting room to the bedroom and a high level window in the wall dividing them. The toilet door opens to the bedroom.

#### Recreation and Social Buildings

Except for the churches and mosque, there are no other buildings to be considered under this heading. The open field to the north west end of the barrack has been converted into a football field.

### Mechanical Transport Buildings

This group was originally adjacent to the south gate entrance, on a fairly level ground. On the west and south of this site are rows of blocks accommodating junior ranks. To the immediate north is the Quartermaster store. A lot of adjustments have had to be made to the buildings to meet the present requirements as well as conversion of some areas within the Barrack to part of the mechanical transport yard.

### Electrical Services

The National Electrical Power Authority (NEPA) have made a single 11 kv supply to the Barrack. This serves three sub-stations on a ring main from where the distribution is provided. A standby generator is also installed near the south entrance gate.

No provision has been made in case of a fire. Fire alarm call, and sounder points, indicator panel, hydrant points etc. are absent. The nearest fire service is about 10 km away. There is no external telephone connection to the Barrack.

### Drainage, Water and Roads

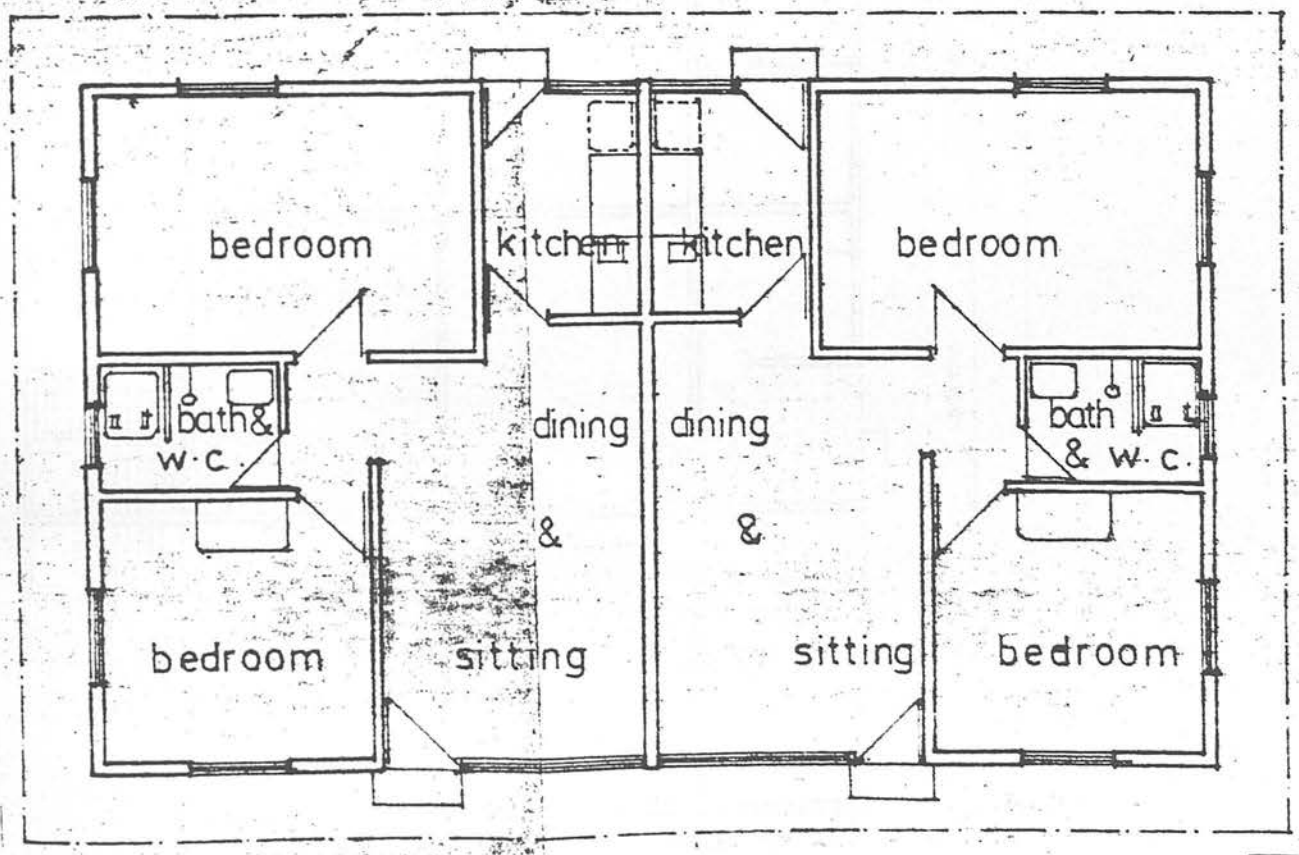
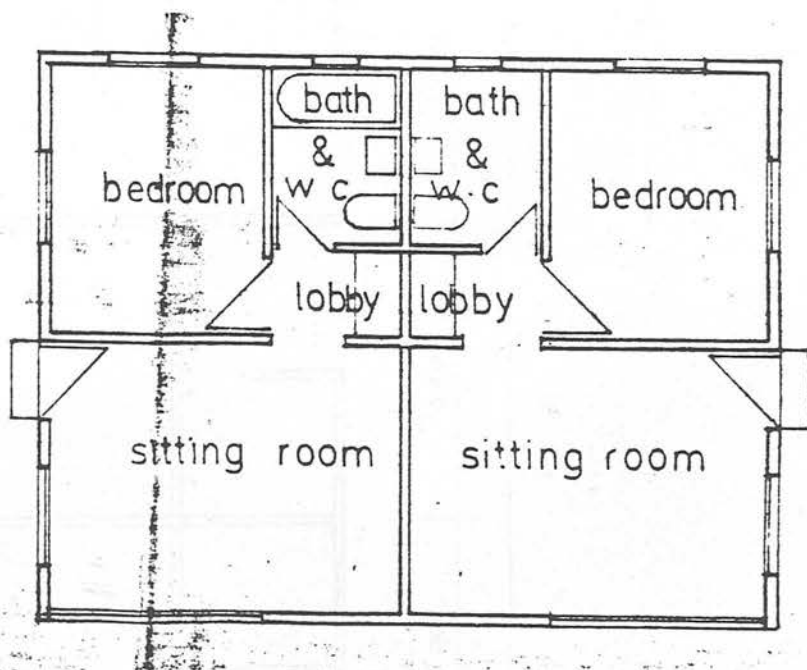
No particular drainage plan has been made for this barrack but due to the general slope of the site, only very few sections of the barrack get water logged after a serious rain. The water supply to the Barrack is got from the main town supply. The Barrack has a huge water storage tank. The main roadways are tarred with bitumen macadam base and wearing courses. Precast concrete kerbs are provided.



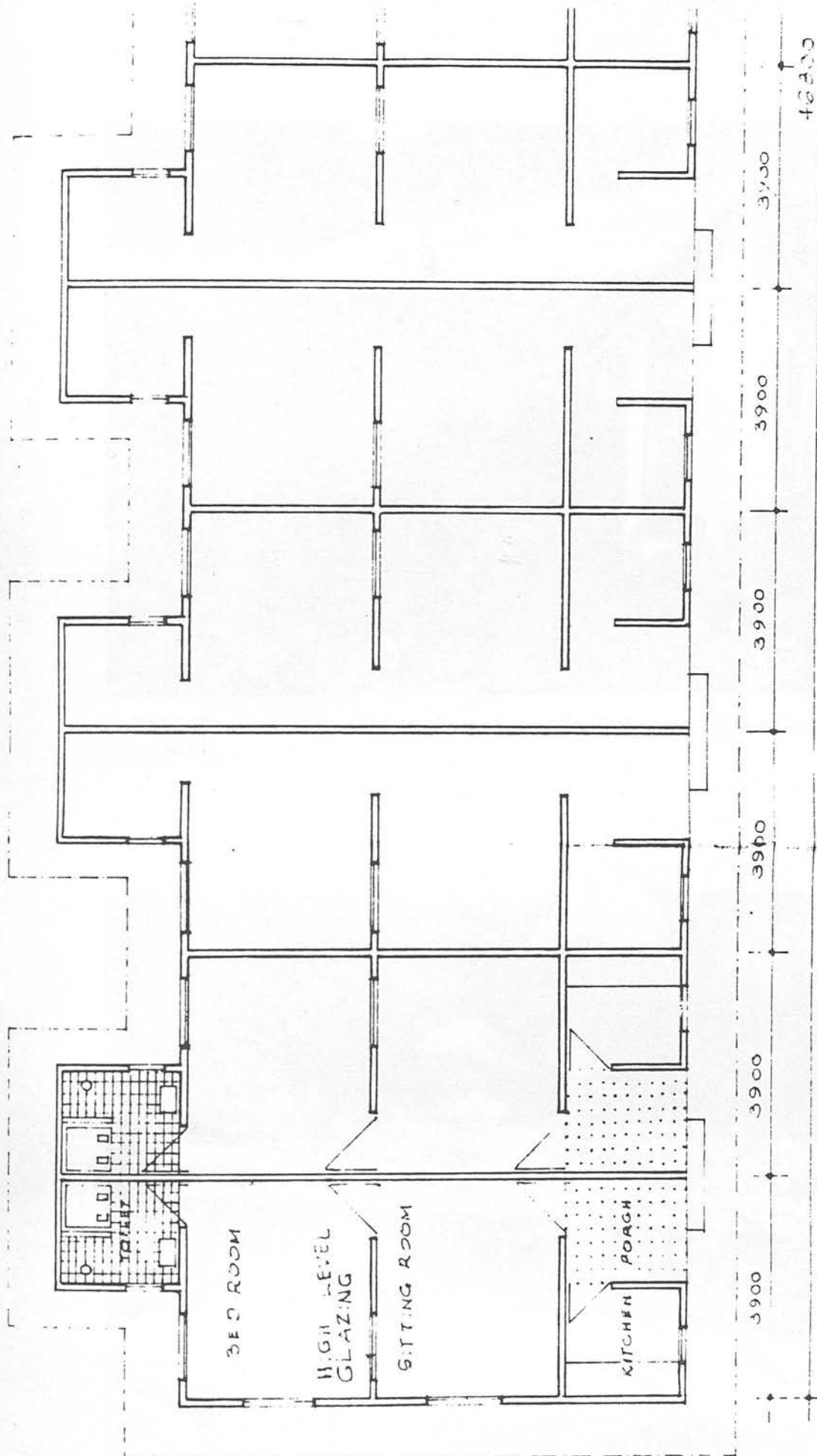


107. Soldiers of the Nigerian Regiment mounting a Guard of Honour for Her Majesty the Queen (1956) during the Royal tour of Nigeria.

108. Single Officers' quarters - Basawa Barrack.



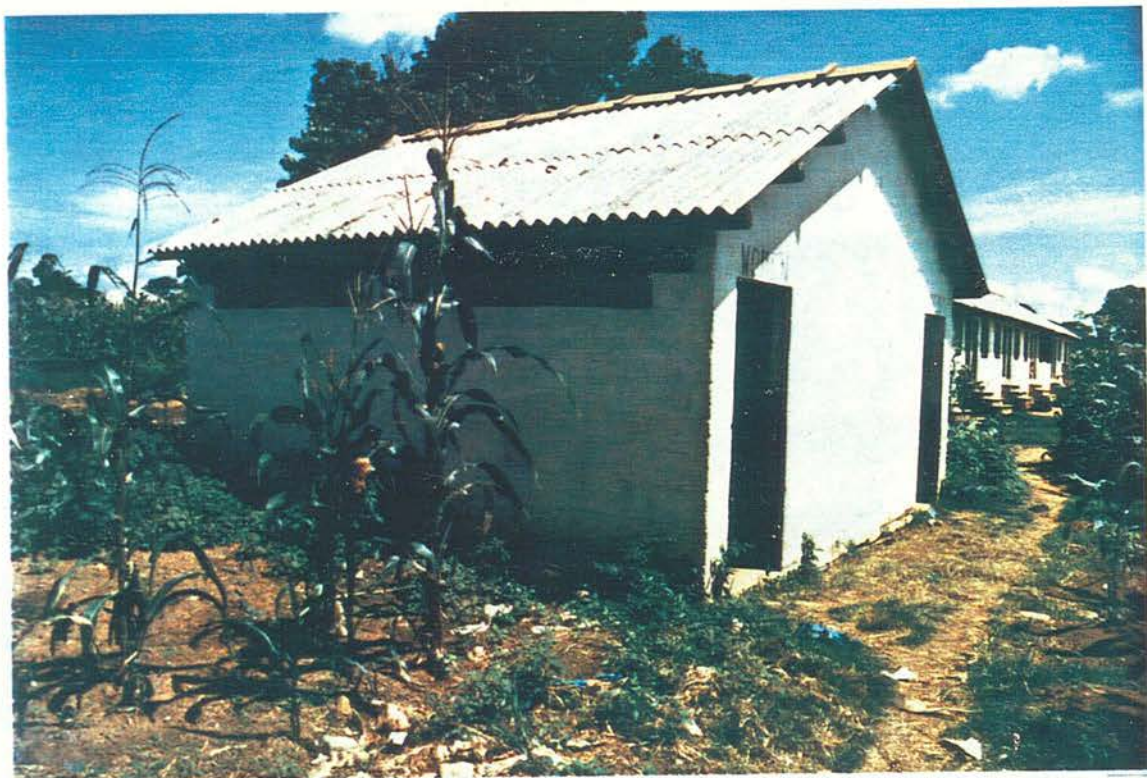
109. Warrant officers and sergeants' quarters - Basawa Barrack.



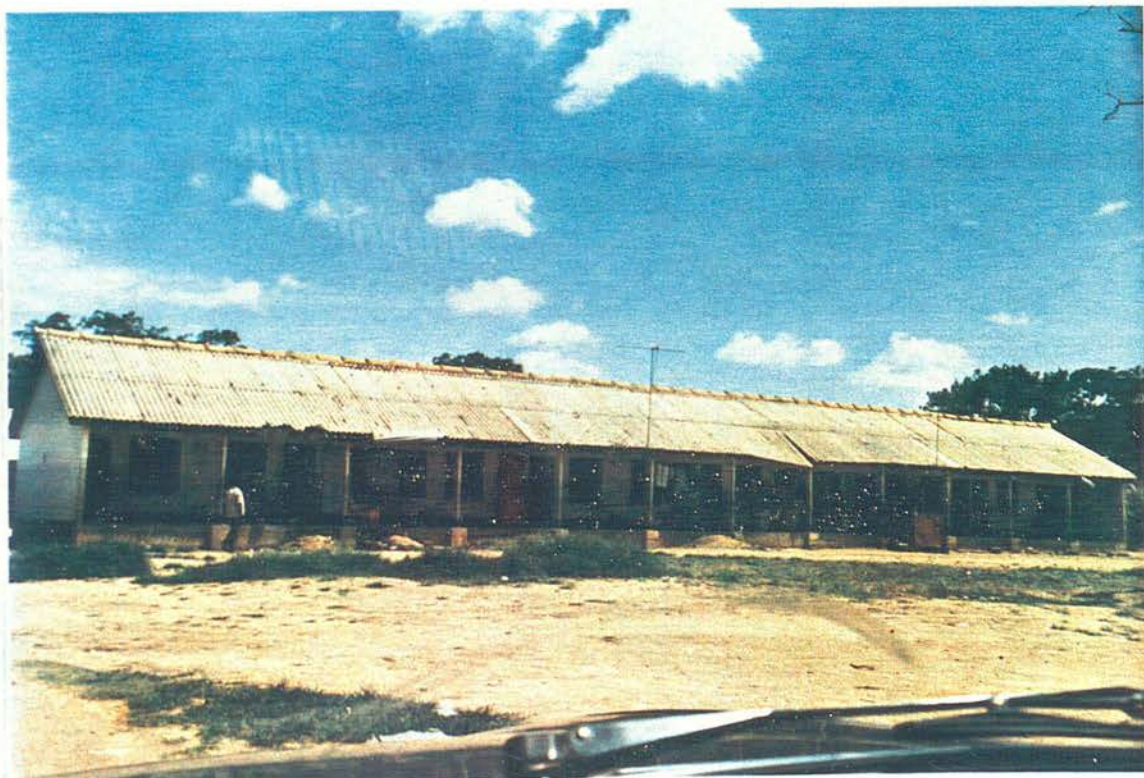
PLAN

110. Plan of soldiers' 12-family Barrack block - Basawa Barrack.





111. Communal toilets in soldiers' housing, Nigeria (late 1950s).



112. Soldiers' 12-family block housing, Nigeria (late 1950s). Long rectangular building divided into 12 single rooms each for a soldier and his family.





113. Warrant officers and sergeants' housing, Nigeria (1960).



114. Kitchen for the Soldiers, Nigeria (late 1950s).





115. Row of rectangular barrack blocks built in the early 1960s.



116. Row of triple-storied barrack blocks built in the 1970s. Algeria.





117. 30-family soldiers' barrack housing block built in the early 1960s.



118. 30-family soldiers' barrack housing block built in the 1970s. Nigeria.

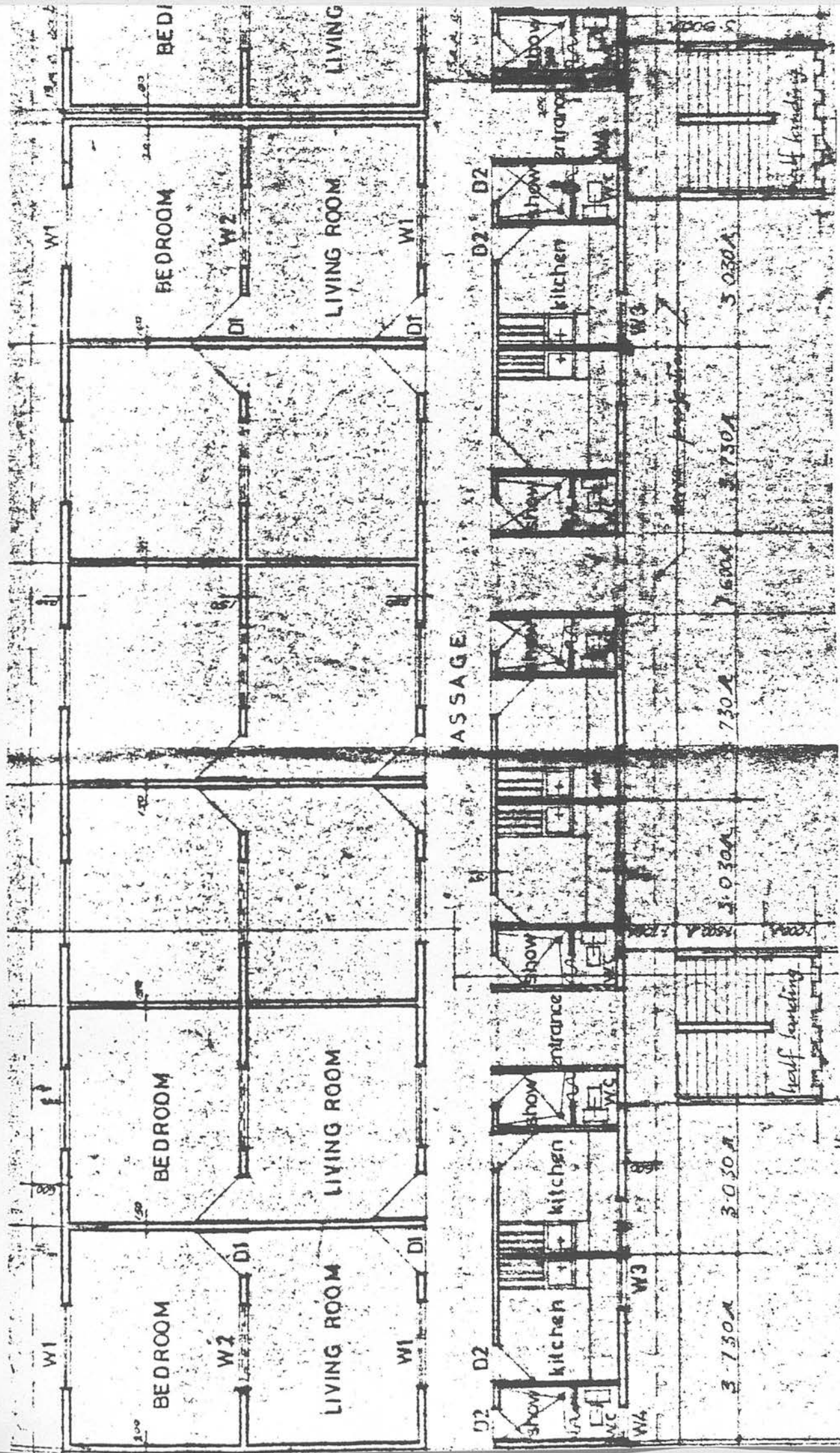




119. The space outside the barrack block - old blocks.



120. The space outside the barrack block - new blocks.



121. Plan of a 36-family soldiers' housing block, Nigeria.





122. The Barrack environment - Basawa Barrack.



123. The layout of barrack blocks - Basawa Barrack.





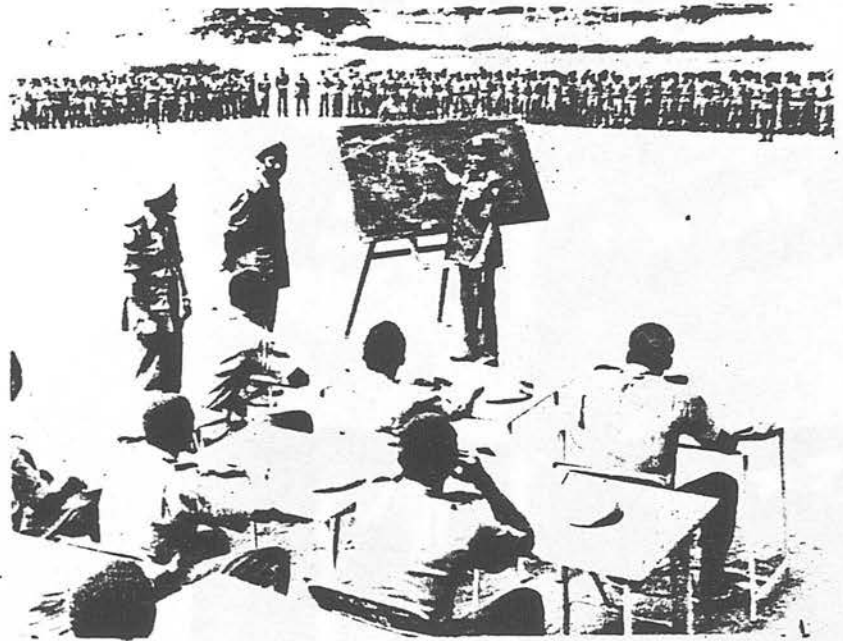
124. Soldiers' quarters built in 1958. One-story block built to accommodate 12-24 families with communal sanitary rooms at both ends of the block and the individual kitchens in the protruding middle part of the block.



125. Front view of barracks block in 124.

## GOC Holds Chalk To Eradicate Illiteracy

The General Officer Commanding, 2 Mechanised Infantry Division, Brig Sani Abacha holds the chalk as part of the activities of Mass Literacy Campaign aimed to eradicate illiteracy by 1989 in totality. Standing first on the (left) is the Assistant Director of Army Education Corps, Lt-Col Paul Olu Odediran, followed by Major Z U Aikhoje.



127. Eradicate illiteracy campaign.

## Barracks Accommodation Problems

May I be allowed through this medium to make suggestions to the appropriate authority over barracks accommodation problems, besetting the troops.

Ten years after the cessation of the civil war, it is difficult for members of the armed forces to be adequately accommodated.

The fortunate ones are inadequately quartered, while married and unmarried NCOs are lumped up indiscriminately.

The Nigerian Army occupies an enviable position in Africa, as such soldiers should be made to live in congenial atmosphere befitting human habitation to ensure a healthy mind in a healthy body. This conforms with the pledges of President Shagari and the Minister for Defence to improve the working conditions in the Army generally.

SGT MUFTAU OYEDELE  
Lagos

## Is it an Architectural Mistake?

Please allow me to air my observation on the newly-commissioned barracks at Ojo Cantonment.

It is observed that the new barracks have toilets constructed right inside the bedroom. What is the rationale of such architectural design? Is it architectural or constructional mistake? I think it looks absurd for visitors to pass through the bedroom in order to gain access to the toilets.

I wish those concerned will look into this issue for future correction because, the way the buildings are being constructed shows that, 'anything can serve the men in khaki'. A good architect should have not make a design that would not give privacy to bedrooms.

CPL UMUKORO VINCENT  
Lagos

128. Two letters from soldiers to the editor of the Army magazine - **SOJA**.



129. The slant between two blocks.



130. below. row of 56-family  
apartment blocks built in the  
1980s.



### Barrack Environment

The image of a barrack is largely determined by the character and siting of its buildings. The objectives of site planning and architectural design must go beyond the need to satisfy the functional requirements of a building. They should strive to achieve an ordered sense of place; a comfortable, attractive and functional setting for its intended activities. While conditions vary according to a particular Barrack's location, unit's role and setting, a number of common problems have occurred in the design and siting of buildings at various Barracks. Buildings are typically organised within a grid network of streets that can easily result in a visually monotonous development pattern and can limit building design and expansion opportunities; when facilities were sited on a case-by-case basis without an overall conceptual framework or master plan, a chaotic development pattern often resulted where buildings were poorly related, both visually and functionally to each other as well as to the circulation and open space systems of the Barrack; Natural site features such as topography, trees and scenic views were often ignored in designs; the space between buildings has often been considered "left over" space without appropriate planting; a lack of design co-ordination often exists between buildings and their site development components such as lighting and signing; many buildings have been designed and sited with little regard to climatic conditions; a road circulation system should define a hierarchy of flow from Barrack entrance to major and minor roads leading to specific destinations. In many cases a sense of road hierarchy does not exist or has not been visually reinforced, resulting in an unclear system as well as unnecessary complexity; outdoor signing and graphics on Military Barracks are too often confusing, unattractive or obsolete.

The motorist isn't always provided with sufficient information at critical decision points, and is sometimes confused by a clutter of sign messages. A co-ordinated signing system seldom exists, and basic rules of visual communication are often overlooked. This often detracts for the overall image of a Barrack, frustrating the visitor and sometimes creating unsafe conditions. Confusion and clutter result when signs of varying sizes, shape and function are added to existing signs with no consideration for their relationship to each other. Without the discipline of an overall system, signs become both unattractive and ineffective. A sign's fundamental purpose is to communicate information. However, putting the information or message across emphatically is not enough. It must be attractive and harmonious with its surroundings. Consideration must be given not only to what a sign says but also to how it says it, its visual appearance and organisation, its location, its structural support system and its relation to the other signs within a Barrack.

Establishing and implementing a co-ordinated signing system is a relatively simple, inexpensive but effective means of improving the visual appearance and functioning of a Barrack. An inadequate or poorly designed storm drainage system is another problem peculiar in many Barracks. Often open drainage ditches or channels are improperly designed, resulting in a number of problems including: soil erosion, unsafe conditions, and recurrent and costly maintenance problems.

Military Barracks should provide efficient physical environments conducive to attracting and retaining skilled and motivated personnel. The design, location and maintenance of individual elements such as buildings, roads, parking areas, signing and planting, affect the quality of the visual environment.

Each of these elements should be functional, attractive and harmonious with its surroundings to create an environment that enhances the capabilities of Barracks to support their roles and foster pride in and commitment to Military service.



## CHAPTER FIVE

### CONTEMPORARY MILITARY ESTABLISHMENT

Nobody has yet devised a substitute for armed forces. According to Adam Smith,<sup>1</sup> the first duty of a sovereign, that of protecting society from the violence and invasion of other independent societies, can be performed only by means of a military force. Most countries in the world today implicitly accept this proposition and have prepared themselves with varying degrees of effectiveness to carry out this first duty if circumstances make it necessary. However, other means of resolving differences between nations are being sought. To this end, international organizations such as the United Nations (UN) have used up endless man-hours in searching for alternative ways of securing peace. The two super powers have paralleled these efforts in searching for an operating formula that will give each of them security - the Strategic Arms Limitation Talks. These talks are not aimed at general disarmament but are confined to seeking a method whereby the Russian and American governments can control their arms race. In the meantime the World is threatened by violent challenges to the status quo, both from within and between countries, and, as the search for non-violent means of reconciling irreconcilable differences continues without any end in sight, the powers concerned tend to resort to the use of their armed forces.

Professor James Eayr<sup>2</sup> of Toronto University, in justifying the Military Establishment, listed six purposes it may serve : Strategic; Insurance; Law and Order (domestic and foreign); Modernization and Development; Ceremonial; and Diplomatic.

1. Adam Smith. An Inquiry into the Nature and Causes of the Wealth of Nations Book V p.43 (Dublin: Messrs.Whitestone.1776)

2. James Eayr, 'Future roles for the armed forces of Canada', in Foreign Policy Review Vol.XXVII (April 1969).



Strategic forces are seen to be "maintained primarily to attack one or more states, or to deter one or more states from attacking the homeland, or to defeat the attacker if he is not deterred". The strategic is the original primary military function, which according to Eayr, Israel best demonstrates. In the case of insurance, the security problems of third World governments are relatively more serious<sup>3</sup> than those of the developed countries. Many of the governments of the developing countries are under constant pressure from insurgency or the territorial claim of neighbours. The developing countries as independent political units have to survive against internal and external threats, and they require an effective force as insurance against potential and actual challenges to their right to rule. Under law and order (domestic), Eayr includes aiding the civil power, disaster and emergency relief and civil defence. The foreign aspect of this role is more generally known as peace-keeping and includes duties in support of the United Nations. The effort to manage conflict has been made by forces of the U.N., acting in an international police capacity, in the Middle East, Congo and elsewhere. The Organization of African Unity (OAU) force also acted in a similar capacity during the Chadian crisis. The outlook of such Peace Forces differs from that of traditional military force in several ways; the goal is not victory but control of the conflict; there is no enemy, only parties whose conflicts endanger the international situation; the role of the Peace Force is to act with as little violence as possible.

3. by "more serious" is meant that they are under more constant challenge internally and externally. The super powers may be in implicit conflict with each other, but this is a cold war rather than one that threatens to become "hot".

The use of the Military to bring about development and modernization applies particularly to the developing countries. The domestic production of military hardware can be viewed as part of the programme of industrialization. Without an industrialization programme, the country cannot become independent politically. A defence industry helps achieve the former and guarantees the latter. Military production thus introduces new dimensions to the solution of the industrialization problem. First is in the nature of the product. The government exercises a monopoly of organised violence, and therefore the instruments of violence have a ready and assured monopolistic market. That governments have large markets for weapons can be seen in the size of some of the military establishments of these countries. Secondly, the military procurement sector of these countries must have a substantial domestic impact. Large numbers of men have to be fed, clothed, sheltered, trained and supervised. The administrative systems required just to control their location and their movement will require all kinds of inputs from the economy. The arming and supplying of these troops with even simple weapons, and maintaining and repairing them provides a substantial market for a domestic industry even if confined to small arms and ammunitions. Because National security is a prime objective of a government, the production of weapons for the national forces is normally protected from competition. Moreover, armaments, naval crafts and aircrafts have a high dependence on metal processing, metal fabrication and metal machining. Therefore, it can be assumed that where armaments production is undertaken there will be some call upon the metal manufacturing sector. The United Nations manufacturing classification lists seven of its sub-categories as possible contributors to the defence programme:<sup>4</sup> iron and steel;

4. UN, The Growth of World Industry, New York, 1969 Vol2.

non-ferrous metals; metal products, not machinery; machinery not electrical; electrical machinery, shipbuilding and repairing; motor vehicles. In the developed countries, there is obviously a connection between military spending and general economic prosperity. If some countries were to disarm rapidly and extensively, they would face serious problems of unemployment. It is also true that some business firms in the electronics and aircraft industries receive very large military contracts. The military in the newer countries is also an agency of modernization. It is one of the few comparatively well-organized and technically equipped modern institutions. The military career often leads to a successful civilian career, as in Israel. The military also brings together members of different ethnic and religious groups, thus becoming an institution of socialization for a heterogeneous society; the integration of blacks and white in the United States Army, the French-speaking and English-speaking groups of the Canadian army, the Flemings and Walloons in the Belgian Army, and the various ethnic groups in the Nigerian Army. The ceremonial role of the military is one which few states in history have done away with completely, and even the Vatican City keeps an armed force of 220 Swiss Guards. Ceremonial parades are a constant source of pride to the military and the Nation as a whole.

## MILITARY ORGANISATION

In some respects, contemporary Military Establishments have the characteristics of any large-scale bureaucracy. But the Military Establishment, regardless of its societal context, has a unique character because the threat of violence is a permanent reality to its Leaders. The Military is characterised by the organised use of violence, on behalf of the state, if necessary to safeguard its existence. The results of previous wars and the pressure to prepare for future wars pervade the entire organization. This implies that under such circumstances a hierarchical structure of the organization is indispensable. However, changing technology creates new patterns of war and thereby modifies organizational behaviour in the Military. The more complex the technology of warfare, the narrower are the differences between military and non-military establishments because more officers have managerial and technical skills applicable to civilian enterprise. Yet even the most automated military establishment retains an organizational format which reflects the necessities of war. Even then, it is a social system, that is, a human institution which can be viewed in sociological terms. At times, the military are engaged in intense activities, but much of the life of a military formation is on a stand by basis.

Throughout history, the military organisation has shown a varying picture, the hierarchical structure sometimes being stressed more, sometimes less. The rigid and already rather complex organization of the Roman legions, where strict obedience was required, was followed by the loose and undifferentiated structure of the prefeudal and feudal armies. In particular the mercenary armies in the late middle ages, in which action was in masses and the performance of each soldier

individually were important. In the seventeenth century, however, the Roman type organisation was rediscovered, and reintroduced by army innovators such as Oliver Cromwell of Britain, Prince Maurice of Orange and King Gustavus Adolphus of Sweden. The introduction of new weapons and tactics made the success of operations depend more than before on the dedication and ability of the individual soldier in a group. Drill was introduced and also severe penal sanctions against disobedience, in order to improve control of the individual soldier's behaviour, making him reliable in the increasingly complex military machine. The officers' authority was derived, apart from their formal position, from their superior knowledge of the art of warfare. Since the eighteenth century, however, officer posts were chiefly occupied by nobility, while the men were recruited from the lower strata of the society. Officers and men were from that time divided by a wide social and cultural gap. This resulted in the nineteenth century structure of the organization which was characterized by the idea of total submission, in particular of the lower ranks, and passive obedience to superiors (which was in accordance with the subordinate position, in civil society, of the class they were recruited from). According to the maxim of Frederick the Great, a soldier must fear his officers more than his enemies.

The Saxon-Polish field service rules of 1752 stated:

"For the officer, honour is reserved, for the common man obedience and loyalty... From honour flows intrepidity and equanimity in danger, zeal to win ability and experience, respect for superiors, modesty towards one's equals, condescension towards inferiors, severity against criminal... Nothing therefore must incite the officer but honour, which carries its ~~own~~ recompense; but the soldier is driven and restrained, and educated to discipline by reward and fear..." 5



However by the turn of the nineteenth century, the nobility's monopoly of officership came to an end. The deep division between officers and soldiers, however, remained. The two categories were recruited from different classes, slept in different quarters, were fed from different kitchens. The idea of a machine-like army, based on strict and passive obedience to orders, which left little freedom of discretion to officers and still less to soldiers reigned unchallenged until the first World War. The developments of the twentieth century, however, have entailed far reaching adjustments to this model.

Developments in the technology of warfare, which have increased range and destructive power of weapons, and changes in the level of skills, forced adaptation in the structure of military organizations. In the nineteenth century army, the limited differentiation of military activities required little horizontal co-ordination and was reflected in a simple linear vertical structure of command. Even within this vertical linear structure, complication has grown with the increasing scale of operations and length of command lines, and with the introduction of telephone (later radio) by which orders were transmitted. For persons at the lower end of the line this has entailed less clarity about what is expected of them than there was in the times when the commander was physically present and, from horse or hill, visibly directed his men.

A further important complication of the authority structure has been the appearance of staffs. As distinct from the linear command structure, a line and staff structure implies officers holding advisory positions which are not incorporated into the line of command. Formally, staff officers are authorised to advise their commanders, not to command themselves.

This implies that a person's position in the formal authority structure is no longer solely determined by his rank. But although they may not be authorised to intervene directly, staff officers have often so much power that in practice their advice has the weight of executive orders. Their rank, together with their position as a member of the commander's staff, and the knowledge and the derived distinction inherent in that position, give them an authority which cannot be ignored. In some instances, a relatively junior staff officer issues orders in the name of his commander to officers in the line, even though the latter are superior to him in formal rank.

The rapid advance of technology, especially in the last decades, has had an impact on the type and distribution of authority in the military organisation. Initiative, instead of passive and servile obedience, has become a value of utmost importance. Furthermore, the technical complexity of weapons and other equipment has made it impossible for a commander responsible for their deployment to master all the skill and knowledge required for their handling and maintenance. His decisions have come more and more to depend on advice on technical matters given either by direct subordinates or by specialists standing outside the chain of command, and whose capacities and conduct are mainly beyond his control. The advance of technology has entailed an increase of expert - instead of routine - tasks, which require creativity and judgement instead of passive compliance with commands of superiors. The blind execution of predesigned acts, hammered in by protracted drill, is not a suitable way to find the cause of a tank or radar breakdown, repair it, and find ways of preventing its recurrence. Furthermore, although it is still quite common for very young inexperienced officers to receive command over much older and

experienced non-commissioned officers (NCO), the emergence of skill on all levels of military organization tends to weaken the distinction that divides soldiers from officers in terms of technical expertise. The two categories are now recruited from less distant social classes. The social barrier between officers and soldiers has been further reduced by the commissioning of large numbers of non-commissioned officers. As a consequence, the men tend to feel more justified in criticizing the conduct and orders of their officers. And, more generally, an atmosphere has developed in which subordinates expect to be consulted when decisions are made that concern them. Besides, many highly skilled military technicians are very valuable on the civil labour market. To attract men like them to the service and prevent them leaving, military authorities must ensure that their accomplishments are respected inside the forces as well as outside.

## SOCIAL COHESION

The reasonings as embodied in "Cohesion and Disintegration in the Wehrmacht"<sup>6</sup>, and the attitude research of the American soldier<sup>7</sup>, highlighted the importance of cohesion as a basis for combat effectiveness. The intimate social solidarity of the military profession, which civilians often both envy and resent, is grounded in a peculiar occupational fact: separation between place of work and place of residence, characteristics of urban occupations was totally absent. Instead the military community used to be a relatively closed community where professional and residential life have been completely intermingled.

6. Edward A Shils, and Morris Janowitz, 'Cohesion and Disintegration in the Wehrmacht in World War II, in Public opinion quarterly, Vol. 12, Summer 1948, pp.280-315.
7. Stouffer, Samuel A, et.al., The American Soldier: Studies in social psychology in World War II (princeton N.J.: Princeton University Press, 1949)

Sociologists strongly believe that some of the basic tensions of industrial society result from the absence of adequate mechanisms for bridging the gap between the requirements of work and the requirements of residence and family life. In the old army, occupation and family life were closely linked. The realities of the profession pervaded family social life, and in turn the military community was comprehensively organised to assist family relations. The result was not only relative social isolation, since military families tended to have more contact among themselves, than outsiders, but also a powerful esprit-de-corps among professional soldiers. The problem of choosing between work and family life did not exist.

The Organisational revolution in the Military Establishment has gradually altered social relations within the Military Community. A combination of developments has enlarged the Military Community and weakened its social cohesion. First, there is an increasing trend towards the civilian pattern of separation of work and residence, because the Military Barrack is no longer able to accommodate all personnel. Furthermore, Military personnel are now more often posted to civilian institutions away from Military Communities. The deadly mission of warfare has required that the soldier be prepared at short notice to abandon his routine and personal commitments. However, less explicit is the fact that any profession which is continually pre-occupied with the threat of danger requires a strong sense of solidarity if it is to operate effectively. Although traditional rules of social behaviour persist in the Military Community to guide the style of life of the soldier, they do not operate as effectively as they did in the past.



Second, the sheer increase in numbers makes it difficult to maintain professional solidarity. The military has many more Barracks and the size of many has grown to the point where they take on some of the impersonal characteristics of an urban metropolis.

Third, the old Military Community was composed almost exclusively of Military personnel and their families. The contemporary Military Establishment has large numbers of civilians. Their presence enlarges and dilutes the Military Community. The same can be said for the presence of women soldiers, for the traditional military profession was based on the solidarity of all-male fraternity.

Fourth, in the past military community was based on sharp class consciousness, as between Soldier and officer and within the hierarchy of ranks. Such social relations could operate as long as Military organisation involved discipline based on domination. With the growth of managerial authority, the rank system remains intact, especially the line between officers and soldiers, but efforts are now made to prevent status from being too obtrusive in the life of the Military Community. Soldiers and their wives no longer can be taken for granted in an institution which operates on the basis of a team concept; they must be fitted into the social scheme and their presence acknowledged. With explicit efforts, steps have been taken to weaken the impact of hierarchical distinction on the next generation. In the past, the rank system influenced the social relations of the children of Military families; some outranked others on the basis of their father's status. Soldiers' children were strictly isolated. In contemporary Military Establishments children are of course fully aware of the status of their fathers. However, the children of soldiers and officers are not segregated in the school managed by the Military.

Changes in the mechanics of Military life have also strained professional solidarity. At one time, the Military style of life was leisurely, but the officer has been transformed into an office worker. Those who occupy command and combat positions in units which are on alert are subject to continuous and extreme tension and live a highly intense life. Those in key positions are under all the pressure of crash programmes and administrative flaps. The up and coming officer can no longer afford to behave in such a leisurely fashion. Being an aspiring military manager means living like his civilian counterpart; it means taking work home at night (or rather going back to the office in the evening because classified documents must be left in the office) or working towards self-improvement through reading and correspondence courses.

The lack of adequate housing and the absence of basic community facilities within Barrack locations also weakens the solidarity of the Military community. Many officers and men still live in civilian communities. Because of greater transferability of skills to civilian employment, plus increased contact with civilian agencies and private enterprises, the professional soldier is more constantly challenged as to the validity of his career choice. He is more likely to judge himself, not by the standards of the Military community but also by the standard of the civilian society. Those who live in the Barracks, find the housing to be inadequate.

Every country has its own culture, and the cultural influence of living patterns and shelter forms cannot be completely disregarded when designing and planning Barracks for soldiers particularly in the developing nations.

Though the Military is often the most successfully westernised of all the institutions in the developing countries<sup>8</sup> - its hierarchical organisation a carbon-copy of the western army, its weapons comparable, if slightly dated, and the organisational prerequisites of a western army, which they invariably copy, follow from the technology common in both (heavy armour, artillery, missiles, supersonic aircraft and logistical capacity all requiring trained and skilled men organised and disciplined) - the soldier's social and cultural background still influences his life style.

8. H.Daalder, The Role of the Military in the emerging countries (the Hague, 1962) p.12.

## BARRACK HOUSING

The experience of the past has been discussed in the previous chapters. The study moves on to the experience of the immediate past, that is those soldiers' housing built or rebuilt after the World War II. That certain problems do exist, both old and new is no supposition. For example, in America in the 1970's, the situation is highlighted by Eric C. Ludrigsen<sup>9</sup>.

Rare is he who talked about housing to a career service member for any length of time without hearing the full catalog of woes. If it's on-post housing, it's likely to be long waiting lists, cramped quarters, shoddy construction, amenities far behind otherwise similar commercial housing and occasionally dunderheaded design of the sort that leaves out back doors and makes some bedrooms accessible only through others. Much of the older housing in the inventory is in deplorably bad condition. This is particularly true of the Korean War era Wherry units which were none too sound to being with and suffered from lack of maintenance when still under private operation. Of course, there are still more than 18,000 World War II "temporary" family quarters and trailers around which - even if classified "substandard" - some people are still unfortunate enough to find themselves living in.....long waiting lists and inadequate room on post, high costs and remoteness off-post are only a few of the problems in an area of services living which Army housing authorities admit is our "No 1 source of complaints and the No.1 pain in the neck".

A military unit is not only a goal oriented formal organisation, but also a residential community. This implies that not only the daily work but also welfare and recreational activities come into the scope of military service. The full military career not only covers the prime of a man's life and can last for up to thirty-five years, but it usually spans many of the major landmarks of his family life as well.

9. Eric C. Ludrigsen "Everyone talks about family housing, but "in Army (March 1970) p.25.

For instance, during a man's military career, he is likely to get married, to see his children born, and possibly to see their education completed. Thus housing, welfare, family problems and education of children cannot be ignored.

The early forms of housing for the military have been shown in the previous chapters. For the British army wife, the Crimean War (1854-1856) was a major stage in official recognition. As Veronica Bamfield states, "what-ever the disgrace and maladministration of the Crimean War, this lasting result was a good one. It liberated the army wife into being a person with a right to bear her husband children and to have conditions in which to bring them up as human beings."<sup>10</sup>

10. Veronica Bamfield, On the strength, the story of the British Army Wife, (London : Charles Knight, 1974) p.77.



The end of World War II saw the beginning of major rethinking in the ways soldiers are accommodated. In Britain and America, a lot has been done to improve the married soldiers' housing. In Britain, for instance, the Parker Morris scale is now used for the space allocation in the Army married quarters. Though this provides more physical space, using Lt.-Col. Densham-Booth's words, "It cannot be said, however, that the same degree of social progress has been made ...." <sup>11</sup>He went further " and by their style and layout, some estates strongly resemble unmarried soldiers' accommodation rather than family living groups." Turner <sup>12</sup> argues that the value of any physical object cannot be sought in terms of its physical attributes, but only in the relationship between it and the user. The result of Densham-Booth's survey of soldiers' wives, showed that only a small minority of soldiers' wives find the environment of a Barrack or military cantonment acceptable in its present form.

Unmarried soldiers' housing in these countries has not acknowledged the changes in the way of life of the soldiers. His living space has not increased with modern expectations and requirements. It has been criticised with regard to the space allocation per man, lack of privacy for the individual, lack of adequate storage space, lack of social facilities and of being inflexible. In the 1950's there was a large programme of building Barrack blocks all over the U.K. to a standard design. There<sup>s</sup> were known as the DFW blocks (Director of Fortification and works blocks) and were of two standard block types.

11. Lt.-Col. Densham-Booth, Social Planning in the 1970-80's (1969) pp. 159-60.
12. J.G.Turner, 'Barriers and Channels for Housing Development in Modernizing Countries in Journal of American Institute of Planners 33, (May 1967) pp 167-81.

One with a pitched roof and the other a flat roof, slightly differing in plan but having essentially the same basic layout (Fig.131).

Both were designed to house a company of 108 men. Most blocks are 3 storeys but a few 2 storey examples were also built, as far as is known of the pitched roof variety only.

The rectangular plan follows a simple basic pattern: a symmetrical layout with multiple Barrack rooms at each end, and communal accommodation ablutions and corporals' rooms in the central core. Only this central area differs in plan form between the two types of block. The entrance hall and main staircase are centrally placed in both but the landings and staircase layout differ, the flat type having two quarter-landings on the stairs and no sitting room on the upper floors. In this case the sitting is provided in a single storey rear extension on the ground floor. This sitting room was under used. The Blocks looked institutional and impersonal.

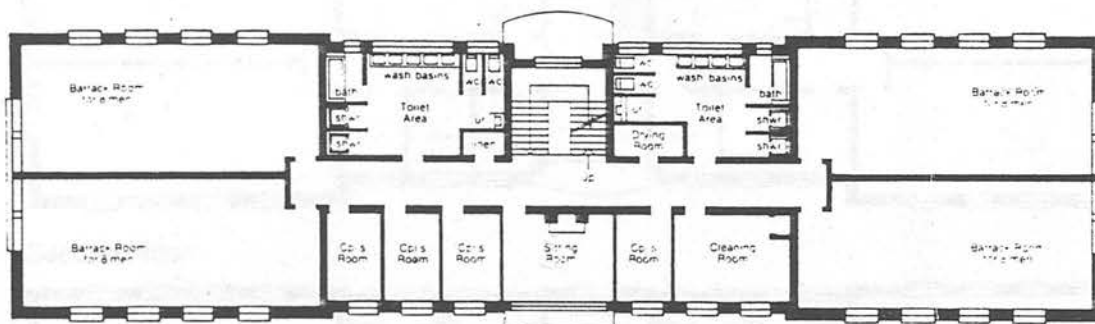
In March 1972, the "X, Y and Z standards" a new scale of accommodation for unmarried soldiers in Britain were introduced (the services Accommodation Code (JSP 325) Scales 3 and 3a). The Barrack flat as it is normally referred to, is the brick or unit of accommodation assembled into buildings in a variety of ways. It comprises of bedrooms, a common room, ablution and a utility room approached through a single lockable front door. The number sharing a flat is between 12 and 18 soldiers and bedroom accommodation is varied between single rooms and small dormitories. The space allocation is as follows:  $8.5\text{m}^2$  per man in the dormitories,  $9.0\text{m}^2$  per man in single room,  $1.4\text{m}^2$  per man in the common sitting room and  $1.4^2$  per man in the utility room. This flat concept of 12 or 18 man units is found to have certain basic problems like lack of privacy, the communal areas being vandalised, under usage of the common sitting rooms, lack of space in the single rooms and lack of personal space in the

existing dormitories. It seems a repetition of old faults.

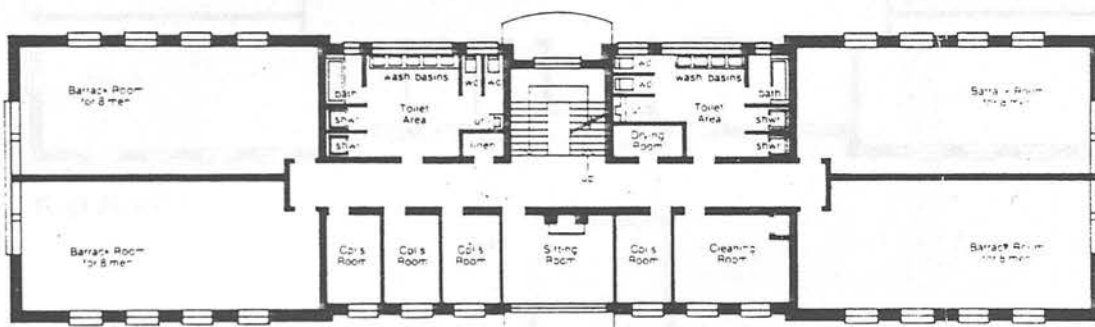
The rejection of this type of accommodation by the soldier, has led to the introduction of another concept just 10 years after, in 1983. Known as the Modular suite.(fig.132-134) the module houses four men and comprises sleeping accommodation, toilet, utility and drying facilities. Each standard module can be constructed with either open plan or single room sleeping accommodation. The first 72 man prototype in Clive Barracks, Tern Hill was recently completed.



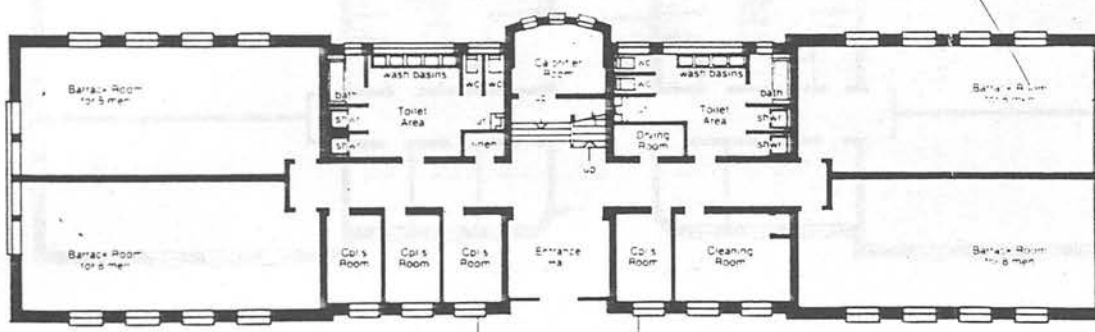
## EXISTING DFW BLOCK • PITCHED ROOF • 108 MEN



Second Floor



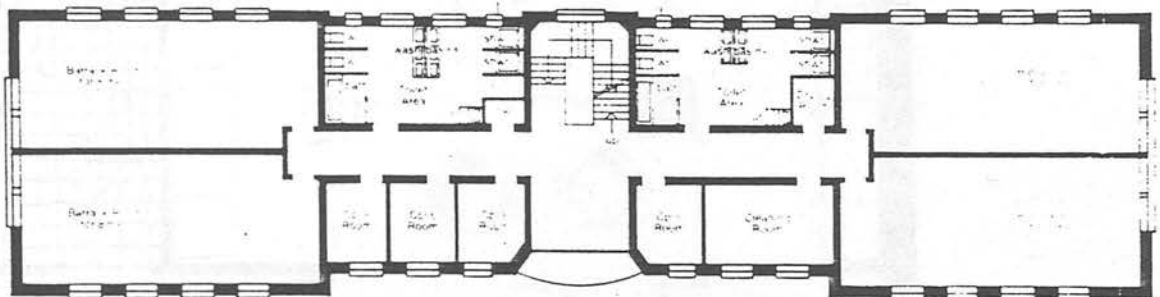
First Floor



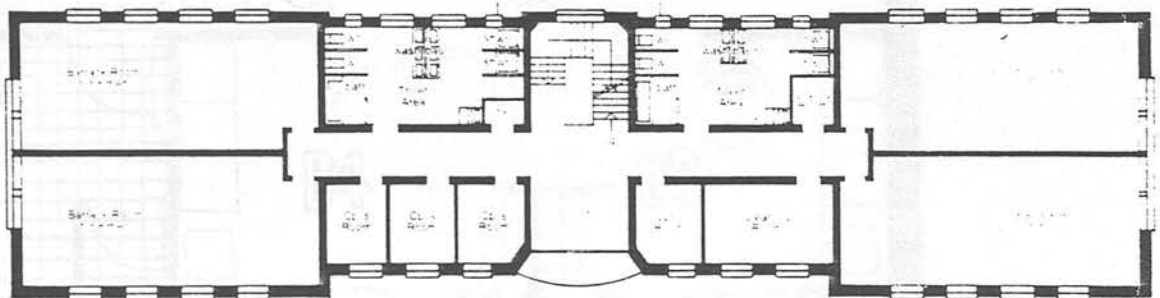
Ground Floor

131a. Director of fortification Works' Barrack room block (pitched roof type) built all over the U.K. in the 1950s.

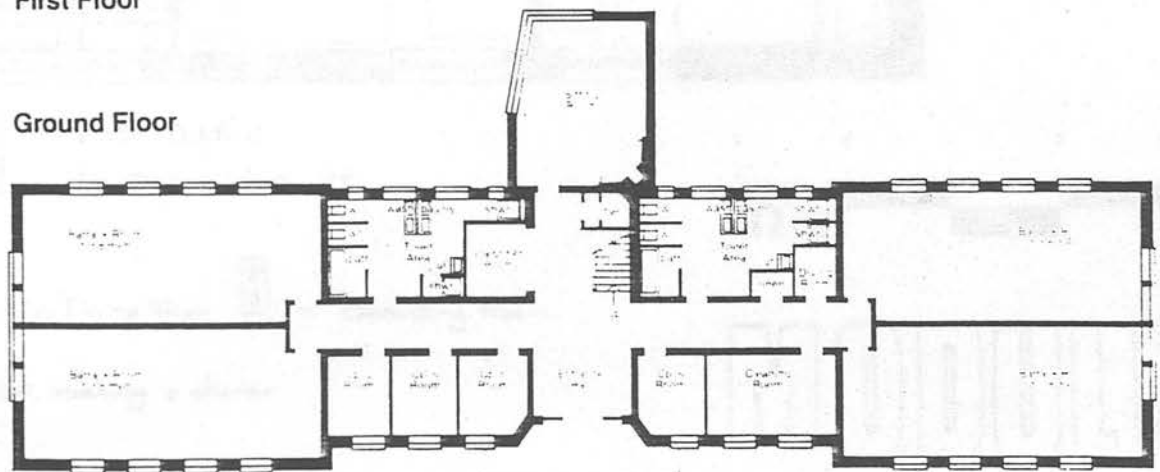
# EXISTING DFW BLOCK • FLAT ROOF • 108 MEN



Second Floor



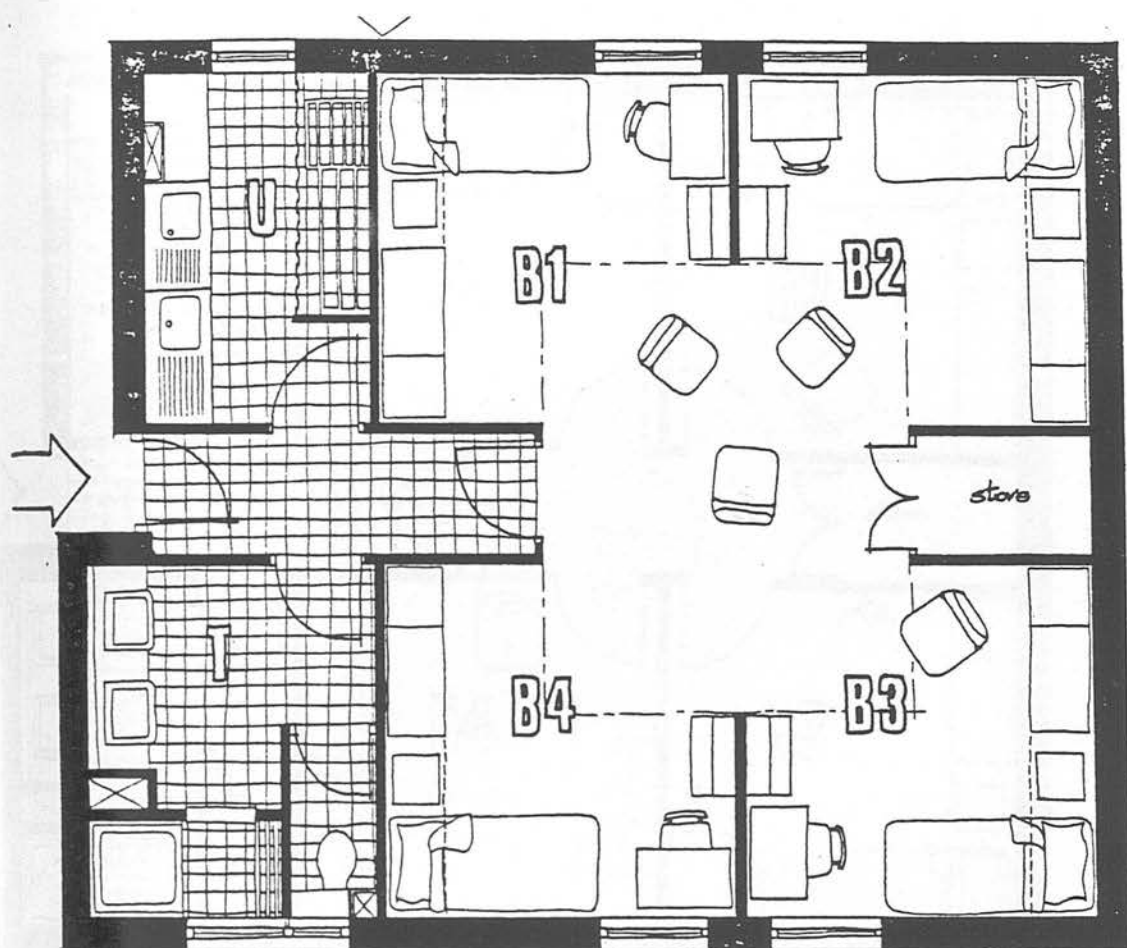
First Floor



Ground Floor

131b. Director of Fortification Works' block - flat roof type.





**PLAN**

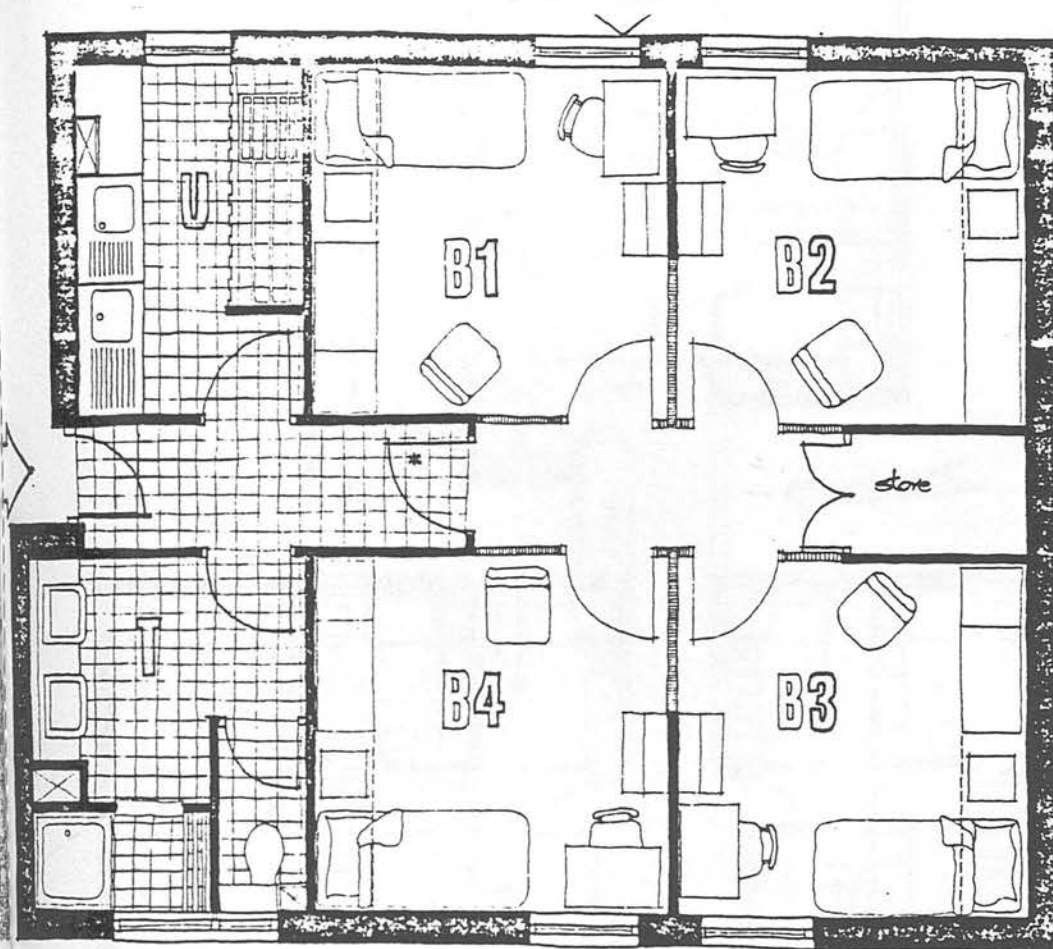
THE BASIC  
MODULAR SUITE



- U - Utility/Drying Room    B - Bed sitting Room.  
T - Toilet, washing & shower

**MODULE**

132. Plan of a basic modular suite, UK (1983).



PLAN

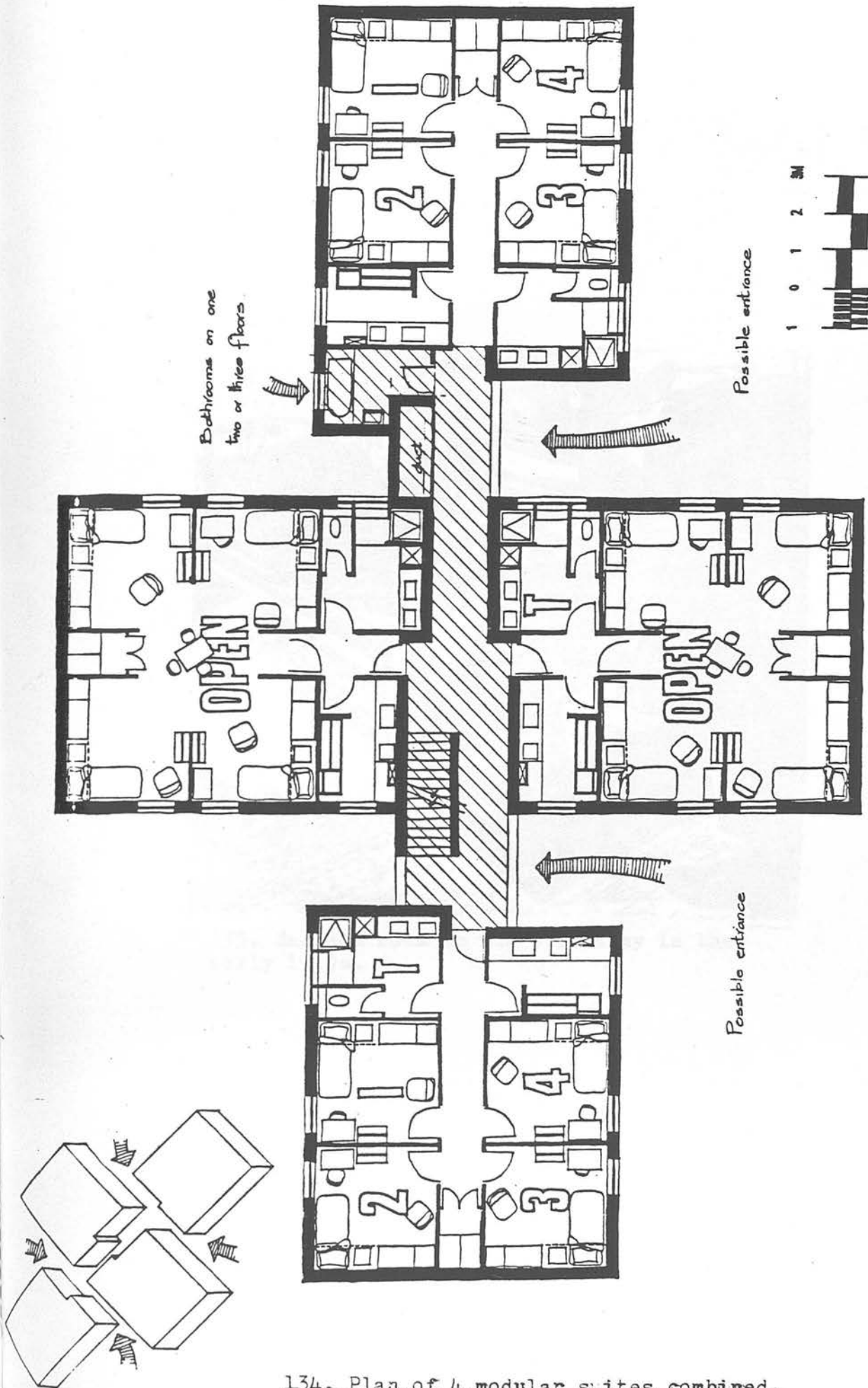
THE CLOSED  
MODULAR SUITE



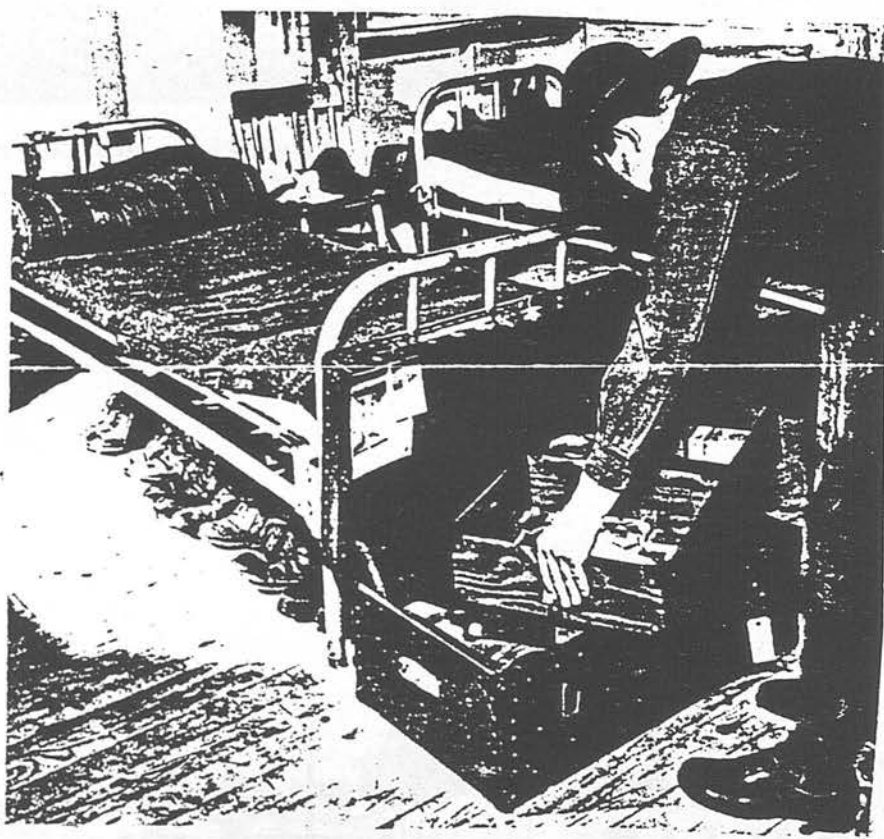
- U - Utility/Drying Room.
- T - Toilet, washing & shower.
- B - Bedsitting Room.

# CLOSED MODULE

133. The Closed Modular Suite for four men introduced in 1983 in the U.K.  
(with individual rooms)



134. Plan of 4 modular suites combined.



135. Barrack room in the U.S. Army in the early 1940s.



136.  
Accommodation for the soldiers of the U.S. Army Anti-aircraft Command (ARAACom)  
in the 1940s.



137. ARAACom soldiers' accommodation 1956





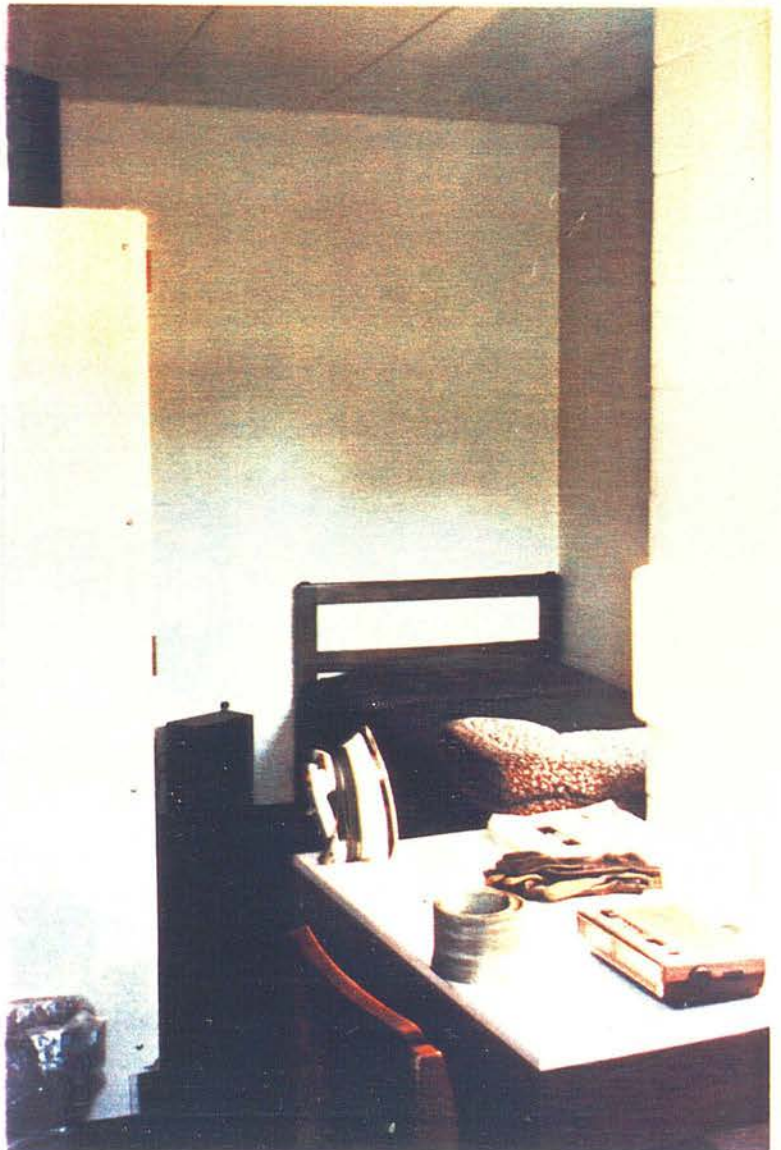
138. Barrack block for soldiers (U.S.Army) in the 1950s. It now accommodates recruits in training.



139. Interior of the barrack block referred to in 138(above) as kept by the recruits.

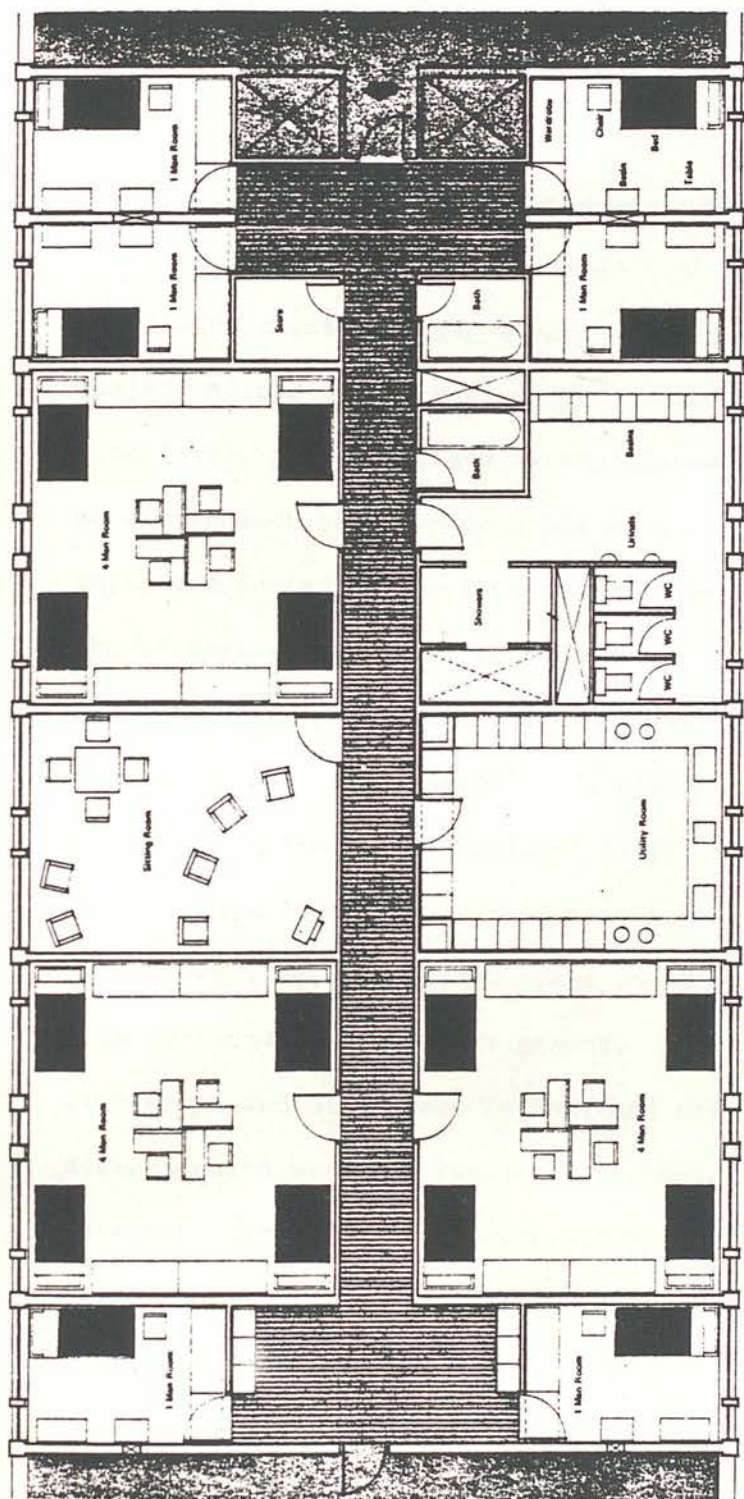


140. Above. Barrack block  
in a U.S. military Install-  
ation (1984).



141. Interior space for a  
soldier in a 4-man room of  
11-man block.





# WELLINGTON BARRACKS REDEVELOPMENT

## 18 Man Flat

142. A recent development of the 18-man flat at Wellington Barrack, London.

## GENERAL

Military Barracks should provide efficient and pleasant physical environments conducive to attracting and retaining skilled and motivated personnel. A Military Barrack conveys a visual image in terms of its design character and organisation that can be either clear, logical and attractive or cluttered, confused and disorienting. The design, location and maintenance of individual elements such as buildings, roads, parking areas, signs and planting, affect the quality of the visual environment. Each of these elements should be functional, attractive and harmonious with its surroundings to create an environment that enhances the capabilities of Barracks to support units and fosters pride in and commitment to Military service. The historical review of development of Military Barracks in the past chapters, provides useful insights into the genesis of most Barrack plans. The historical development of Barrack plan forms can be generally grouped as follows: first, the Roman gridiron system of camps and forts, influenced mainly by the need for speed of erection and dismantling, before and after an attack; second, was the quadrangle plan surrounding the parade ground. This form was very common in the eighteenth and nineteenth century and was influenced by Bastion designs which were the result of defensive requirements; the third observable group was characterised by rigid and formal geometrical plans in the late nineteenth and early twentieth centuries; the fourth group was characterised by the gridiron circulation system and repetitive, checkerboard, temporary construction. A dispersed plan was commonly employed during this period, locating facilities apart from each other in an attempt to minimize their vulnerability to bombing attacks as well as for health and sanitary reasons.

After World War II, the advancement in defence system seems to have lifted the restrictions on plans. The design of living quarters however, are yet to satisfactorily meet the needs of the soldiers.

One aspect of Barracks that has survived all ages, in all armies, in almost every part of the world, is its segregation of the living quarters by rank. This has been so and will continue to be so, in order to maintain that unique character of the military, its hierarchy. It also determines the degree of comfort in the quarters appropriate to the various groups. From the first known Professional army, the Romans: in both their marching camps and forts, the Legate had a house next to the Principia which could accommodate his family and slave household plus a bath-suite, while his other officers, like the Centurions, had their quarters at one end of the block which accommodated the men; the Centurion had a bigger space compared to the men who stayed eight (a tent) in a room. In the early British Army, the Commanding Officer had accommodation comparable to that of a Roman legate, while thirty men at times had to occupy one room. The colonial armies in America, India and Africa were no exception in the concept of segregation to maintain the hierarchy.

It was also regarded as desirable, that Barracks should be self-contained. The Romans for instance only catered for their soldiers and did not recognise wives, children or any other dependant, although they had hospitals, shoemakers, shops etc., within the permanent fort and fortresses. This pattern was followed by later civilisation.



On the whole, the soldiers of those periods had little or no choice - being conscripts, dregs of the society, most lacked other skills and no education - as to where they lived. With the various organisational changes and technological advancement within the military today, a higher calibre of personnel is required. This sort of person will certainly have other choices in the world full of organisations seeking the same calibre of personnel.

Lastly, prior to the twentieth century, the Military tended to live in isolation from their parent societies; the British and the American armies, for example, were isolated in frontier or Colonial posts. Before the first World War soldiers "lived apart in their tiny secluded garrisons much after the manner of Military Monks, and they rarely came into contact with the mass of our citizens " <sup>13</sup> Such isolation clearly facilitated the socialization of recruits, as Baynes <sup>14</sup> and others have demonstrated. Socially isolated Military can function effectively. Historical analogies can be adduced to indicate that such Armies can function, provided that their leaders can create a successful climate for the socialization of recruits. Rothenberg <sup>15</sup> has argued that the Austro-Hungarian army was totally isolated from social and political trends in the empire. Far from undermining its performance, such isolationism, Rothenberg believed resulted in the army's adherence to an almost medieval ethos, a brotherhood in arms, that enhanced its

13. S.P. Huntingdon, The Soldier and the State (Cambridge: Harvard University Press, 1967) p.228.

14. John Baynes, Morale: a Study of Men and Courage (London: Cassell and Company Ltd. 1967,) R.A.Gabriel and P.L.Savage, Crisis in Command: Mismanagement in the Army (New York: Hill and Wang, 1978)

15. G.E.Rothenberg, The Army of Francis Joseph (Lafayette: Purdue University Press, 1976).

effectiveness. He made a strong case for the Army's having performed far better in the first World War than has generally been believed. The nineteenth-century British army was another classic example of a highly cohesive but socially and geographically remote army.

## NIGERIA - THE EXISTING SITUATION

The Military community has undergone a social, economic and political revolution. In material terms, the men are better off than ever before; the average pay-package today buys more than it did before 1966; ownership of television sets, radios, and other household equipments are on the increase irrespective of rank. There is also the mass literacy campaign having its effect among the soldiers. A parallel trend is evident among the Officers. Not only is a degree becoming indispensable, but many Officers are acquiring graduate and professional education beyond the bachelor degree and often sent to civilian universities for advanced degrees. The Nigerian Defence Academy had been stepped up to a degree awarding institution, which means that most Officers who pass through the Academy will soon be degree holders.

With the meteoric rise in strength of the Military after the Nigerian civil war, the immediate post-war utopian vision was of putting a roof over the head of every soldier. Although the post-war years made considerable headway towards providing Barrack housing in terms of quantity, the interest of speed and economy were allowed to take total precedence at the expense of improved standards of planning, design and needs of the soldiers. The height of Barrack blocks were increased, thereby increasing the density of people per block, with the result of breakdown of the services. . . . While it is appreciated that attempts are being made to provide every soldier with Barrack housing, there is a growing awareness of its failures. (Fig. <sup>128</sup>) Thus information on soldiers' attitudes, preferences and expectation has become imperative.

Moreover, architects, planners and military authorities need the information in order to have an insight not only into use of Barrack housing but also into the aspects of Barrack housing and environment desired by the soldiers which will improve their morale and performance while still in service.

By establishing a survey methodology and formulating questionnaires, it is possible to look at the attitude of the soldiers toward their Barrack housing and environment, and to attempt to determine preferences and expectation, as well as to determine how the level of education of the soldier affects his attitude.

## CHAPTER SIX

### SURVEY METHODOLOGY

Housing needs can be better defined by the users themselves than by a panel of experts. Since a housing environment of high quality may be defined as one that conveys a sense of well-being and satisfaction to its population through characteristics that may be physical (housing style and condition, landscaping, available facilities) social (friendliness of neighbours, ethnic, racial or economic composition) or symbolic (sense of identity, prestige values)<sup>1</sup>, it therefore follows that the ultimate satisfaction of the soldiers is the only real test of success in Barrack Housing.

Turner notes that "the only true and real way of assessing the economy of housing is: How well do the procedures and products match the priorities of the users..."<sup>2</sup> He argues that the value of any physical object cannot be sought in terms of its physical attributes, but only in the relationship between it and the user. And as such, the value of a quarter in the Barrack must be determined by how far it satisfies or frustrates the needs of the soldiers. Charles Abrams<sup>3</sup> commented quite often in his works on how experts and officials deplore traditional solutions in spite of their clear social, economic and climatic advantages. Furthermore, as the majority of the Nigerian planners, architects and other housing experts have been trained in the economically and industrially advanced countries of the West, there is always the danger of their uncritical application of Western

1. J.B.Landing and R.W.Masons, Evaluation of neighbourhood quality Journal of American Institute of Planners, 35 (1969) pp 195-199.
2. John C.Turner, Barriers and Channels for Housing Development in Modernizing Countries, in Journal of the American Institute of Planners, 33, (May, 1967) pp 167-81.



Concepts to Nigeria's housing problems instead of appraising and tackling them in terms of local ways of life, specific needs and ways of doing things. The danger is indeed greater as there are no indigenous planning precedents or theoretical constructs for analysing and solving these local problems. In this connection, the United Nations Technical Assistance Housing Mission to Ghana noted that "the only items which can be borrowed usefully from other countries are experience and methods of approach. Yet, even here, selectivity is crucial. Housing must be conceived in the light of the special and peculiar needs, facilities and special circumstances of each country"<sup>4</sup>.

Most experts also tend to judge a housing environment on the basis of physical characteristics. Landing and Masons note that the Planners' ability to evaluate a housing environment's other dimensions is "limited by his training and what he can observe on a visit to the area while residents tend to consider social factors such as neighbourliness in addition to physical environment"<sup>5</sup>. Indeed, it is worth noting that long before the arrival of the designer as expert on the building environment, the act of building was a community task performed by the users themselves. The recent appearance of the expert as the interpreter of the needs and aspirations of the users has, however, led to a discrepancy between the designer's and the user's images of the built environment. In order to improve the feedback from the environment from the user to the expert, the expert must now necessarily assume the role of a co-learner.

3. Charles Abrams, *Man's Struggle for Shelter in an Urbanizing World* (Cambridge: MIT Press 1965).
4. Report of U.N. Technical Assistance Housing Mission to Ghana (1957 ).
5. Landing and Masons Evaluation of Neighbourhood quality.p.196.

"And in that endeavour", noted Lerup<sup>6</sup>, "the designer has to unlearn his preconceptions of what is a good built environment. Of course, it rids him of some of his status and his master-dreams, but the issue is a large one of a commitment to the idea of improving the environment, which may possibly be reached through sharing of responsibility and knowledge". The need to involve soldiers in the design and planning of their environment cannot be overemphasised. The days when soldiers are only to be seen and not heard is gone. For example, the opinion of the soldier who is specially trained to man a radar has to be sought before deploying it. William C. Loring arguing for user participation out of necessity noted that "all types of official action by themselves would not check blight and improve living standards in the residential neighbourhood, unless there was active citizen participation in the effort..... when there is citizen participation in the planning stages of a renewal programme, plans can be formulated which reflect the desires and needs of residents as they perceive them."<sup>7</sup>

Moreover, having had a hand in the planning, residents are already predisposed to accept the plans which they feel they have helped to create, even though the plans finally involve changes in the neighbourhood they would not have agreed to without discussion and change of their attitude.

The idea of interdisciplinary co-operation in the built environment is by no means new. Social scientists turn out research that they feel should aid designers, and designers on their part, when not undertaking research themselves, state what kinds of knowledge they should have handed to them. It is therefore not the intention to add to what already has become an extensive literature on the techniques of carrying out surveys.<sup>8</sup>

7. William C. Loring, 'Housing Characteristics and Social Dis-organisation', in Social problems, 4, No.3 (January, 1956) pp 164-166

6. P.H. Lerup, Building the Unfinished: Architecture and Human Action London: Sage Publication, 1973) pp.340 - 343.

The aim of the survey is to provide explicit quantifiable data. Ravetz<sup>9</sup> very rightly reminds us of several important points. Firstly, this data only becomes evidence once it has been interpreted; secondly, that the questionnaire is not an irrelevancy but is of basic importance; thirdly, the selection of the questions is in the hands of the researcher, and fourthly, the data collected reflects only the researcher's interests and field of study about his understanding of the particular environment. But perhaps the major point to note is that the evidence depends on the researcher's experience, knowledge and insight. The evidence gained from surveys must be considered as contributions to our range of knowledge about human behaviour with-in the built environment.

In addition to the questionnaire, a game situation has been used to determine the soldiers' preferences. Using a game, people can be forced to make a limited number of choices among elements whose relative importance is being assessed.

In a realm where opinion may be inadequate, the game situation provides an added source of needed data.

8. John Madge, Tools of Social Science (London: Longmans, 1953)  
C.A. Moser and G. Kalton, Survey Methods in Social Investigation  
Second Edition (London: Heinman, 1971). David Canter, The  
Purposive Evaluation of Places: a facet approach, in Environment  
and Behaviour. Vol.15 No.6 November 1983 pp 659-698.
9. Alison Ravetz. The Use of Surveys in the Assessment of Residential  
Design in Art 1/3 (April 1971).

## THE QUESTIONNAIRE

Because of the constraints of time and resources, the author was forced to use a self-administered questionnaire in order to obtain the views of <sup>a</sup> sufficiently large sample of soldiers living in Barrack housing in Nigeria. In doing so, the limitations which the self-administered questionnaire poses has to be accepted. It has to be simple and straightforward, avoiding any vagueness or ambiguity, especially with a group of people who are not conversant with such procedures. The form of questionnaire used, given the scale of the survey together with the constraints, was felt to be most appropriate.

However, the development of the questionnaire involved a review of relevant literature, previous unstructured <sup>up</sup> interviews the author has had during the course of duty with Military personnel, and discussions with other Officers in the Quartering Department of the Nigerian Army. After the questionnaires were developed, further discussions were held with expert members of staff of the department in survey research to ensure accuracy and lack of bias in the items.

The author conducted the interview with the soldiers. The enthusiastic support from the Commanding Officers of the Units enabled the soldiers to give full disclosures of their feelings. They were, however, assured that all responses would be confidential and would be used for research purposes only.

Broadly the survey aims to measure the soldiers' attitudes and preferences in Barrack housing while still in service. The questions range from factual, requiring statistical information covering rank, educational level, marital status, etc., to attitudinal, where a 5-point satisfaction scale was used for rating their attitude towards the attributes of various existing Barrack housing, and a 4-point importance scale used for rating their attitude to the attributes they would regard as important in ideal Barrack housing. A number of other items were also included

SATISFACTION SCALE

Very Satisfied	-	1
Satisfied	-	2
Indifferent	-	3
Dissatisfied	-	4
Very Dissatisfied	-	5

IMPORTANCE SCALE

Very Important	-	1
Important	-	2
Indifferent	-	3
Not Important	-	4

in the questionnaire but were not used in the investigation of the hypothesis. These items were used to obtain descriptive information. Such as, "if washing and drying is a problem, why is it a problem". Finally, they were asked how much they would be prepared to pay as rent, if they were to have their ideal Barrack housing. The soldiers do not pay rent for the existing quarters.



## SAMPLING STRATEGY

The sample was designed to represent the soldiers in the Nigerian Army. A two stage sampling strategy was used involving sampling of Barracks and of rank groups at the chosen Barracks. Barracks were stratified by urbanization according to the following criteria.

<u>Urbanization level</u>	<u>Population of nearest town</u>
Rural	up to 50,000
Urban	50,000 - 200,000
Metropolitan	200,000 or over

Although the strength of soldiers is concentrated most heavily in the "metroplitan" areas of 200,000 or more, it was desired to have equal sample sizes from each of the three urbanization levels to permit separate analysis of each level. A total of three Barracks were selected and at each Barrack, appropriate numbers of soldiers from each of the following rank groups were selected randomly from a list of those living in the Barrack: Private, Lance-Corporal, Corporal, Sergeant, Staff Sergeant and Warrant Officers. Data was collected from a total of 295 soldiers.

The self-administered questionnaire was piloted in draft form before being used for the main survey.

This enabled the identification of any difficulties in understanding questions or instructions and to assess the likely length of time taken to complete the questionnaire. A sample group of thirty was used. No detailed analysis of the responses was undertaken. As a result of the questionnaire pilot run, some questions and instructions were slightly restructured where there was some ambiguity or certain words were not fully understood, but overall format remained substantially unchanged.

The questionnaire was of a traditional social survey type, a self-administered structured collection of questions - factual, attitudinal and behavioural - suitable for numerical analysis.

## PRIORITY EVALUATION GAME

The game used here has been developed from the general idea of gaming procedures, recognising that the technique facilitates the recording of raw data which reflects the preference patterns of the respondents. Gaming procedures are by no means novel, having been used for simple descriptive purposes by Michelson<sup>10</sup> Hoinville,<sup>11</sup> and Wilson<sup>12</sup>.

There is a growing body of evidence<sup>13</sup> to suggest that game situations may provide a source of much needed insight into matters of preferences. Hoinville applied the priority evaluation game in measuring a community's environmental preferences in financial terms. It forces the respondents to trade-off various advantages and disadvantages against one another. This technique has been further used by Rowley and Tipple<sup>14</sup> in studying housing and travel preferences of Coloured immigrants and British residents in Sheffield, England.

A brief consideration of the problems of design and technique is necessary for an adequate appreciation of the gaming situation.

10. W.Michelson, 'An empirical analysis of urban environmental preferences', in Journal of the American Institute of Planners. 32 (1966) pp 55-60.
11. G.Hoinville, 'Evaluating Community Preferences' in Environment and Planning 3 (1971) pp 33-50.
12. Robert Wilson 'Livability of the City: Attitudes and Urban development' in F.Chapin, editor, 'Urban Growth Dynamics in a Regional Cluster of Cities' (New York: Wiley, 1962)
13. G.Hoinville and R.Jowell, 'Will the Real Public Please Stand up?' in Official Architecture and Planning (March 1972) pp 159-161  
W.Michelson, 'Urban Sociology as an Aid to Urban Physical Development: some research strategies' in Journal of AIP (March 1968)  
B.Lieberman, 'Combining Individual preferences into a social choice' in Game theory in Behavioural science editors, I.R. Buchler, HG Nutini (Pittsburgh: University of Pittsburgh Press, 1969).
14. G.Rowley and G.Tipple-'Coloured immigrants within the City: An analysis of housing and travel preferences, in Urban Studies ii (1974) pp 81-89

The starting point for this research approach was the need to understand trade-off preferences. The general direction of preferences is already known: detached house, semi-detached house, back yard, more rooms and so on. The major problem lies both in the reconciliation of conflicting preferences and - given limited resources - in the identification of relative priorities. It is on this central feature of "relative priorities" that the gaming procedure is based. The method is to ask people to choose a "mix" of variables from a range of competing alternatives.

The way in which respondents choose between them provides an indication of the trade-off values associated with individual items. A simplified analogy can be found in an everyday purchasing situation. We could, for example, offer respondents a basket of groceries, with each item carefully labelled and priced. At the same time, we could offer respondents enough money to buy, say half of the items in the basket. The way in which respondents allocate their limited wealth can be used to deduct the relative priorities between the items.

In environmental context, for example, a person may wish to live in a quite street rather than in a noisy one. In behavioural situations, however, there is a trade-off of preferences against alternative preferences, such as the convenience of the noisier location in respect of shopping facilities. The simple direct questioning method gives no indication of these implicit trade-offs between several preferences that may occur in the final choice of residential location. The priority evaluation game's main value and advantage as stated by Hoinville<sup>15</sup> is its flexibility. It can examine the preference structure at a micro level in order to establish differences between different

15. G.Hoinville, Evaluating Community Preferences. p.49.

types of person, different types of situation, large and small changes in individual variables and so on.

The priority evaluation game utilised in this study, contains six housing facilities. The number of facilities considered still fall within the limits given by psychologist Miller in not exceeding seven.<sup>16</sup> The six panels can be found on the next page. Each panel consisted of three labelled sketches representing various levels of the facility. A more detailed pilot game was involved in arriving at the six housing facilities used in the final situation.

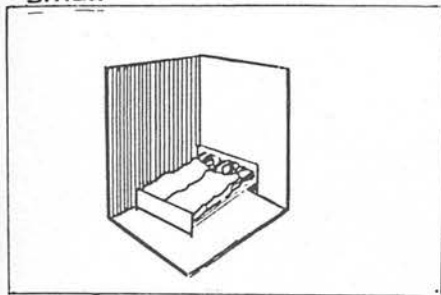
The respondents were asked to look carefully at the priority evaluation game board while the situation was being explained to them. They had a total of six hundred Naira represented by six green counters (each one hundred Naira), being the cost of all the six medium positions on the panels. The first position on each panel costs nothing while the third position costs two hundred Naira. They had to buy only one position per panel and must spend all their counters by placing the counters on the positions of their choice. Having made their choice and placed the counters, this was recorded on the sheet provided.

16. G.A. Miller, 'The Magical Number Seven, plus or minus two: some limits on our capacity for processing information, in Psychological Review, 63, No.2 (1956) pp81-97

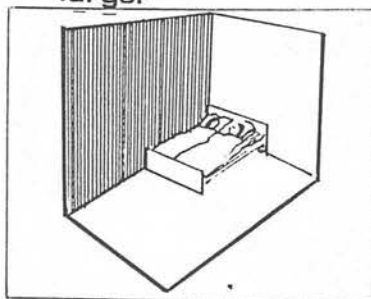


# 1 BEDROOM

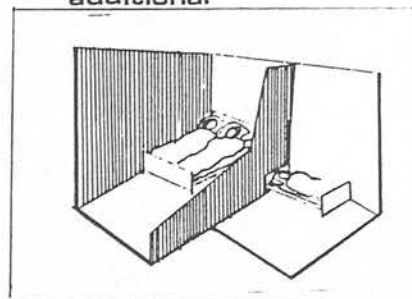
small



larger

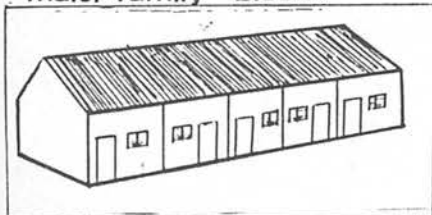


additional

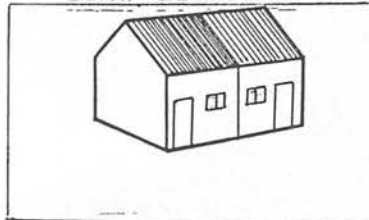


# 2 HOUSE TYPE

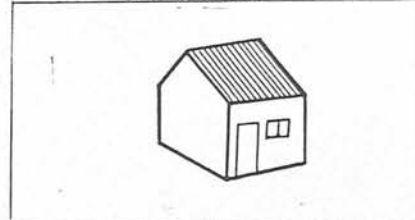
multi-family block



semi-detached

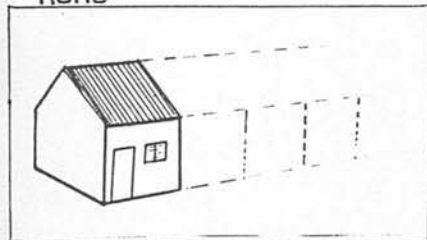


detached

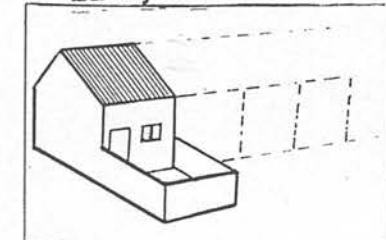


# 3 YARD

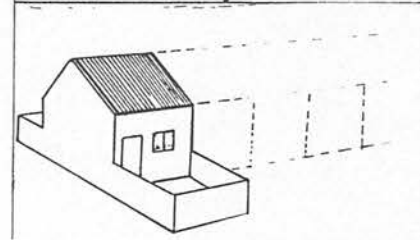
none



backyard

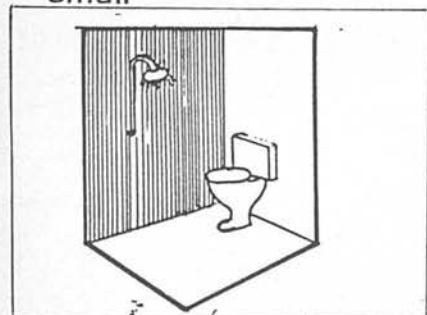


front + back yard



# 4 BATHROOM/TOILET

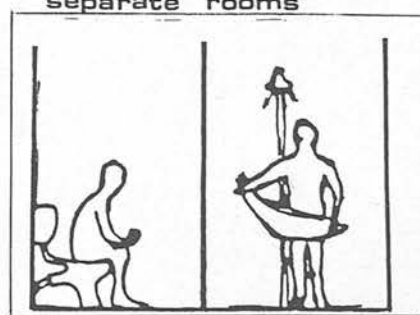
small



larger

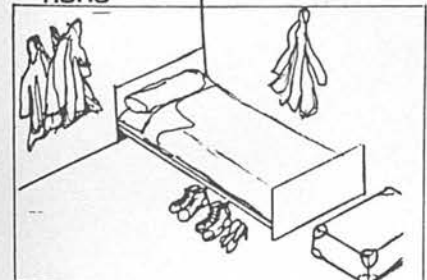


separate rooms

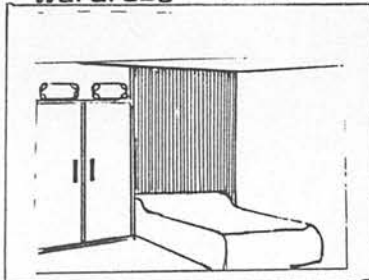


# 5 STORAGE SPACE

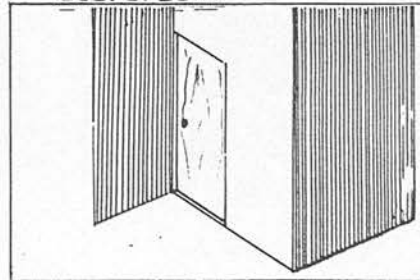
none



wardrobe

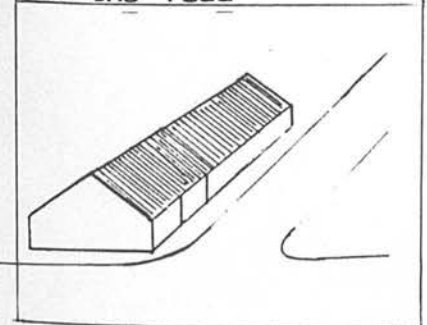


storeroom

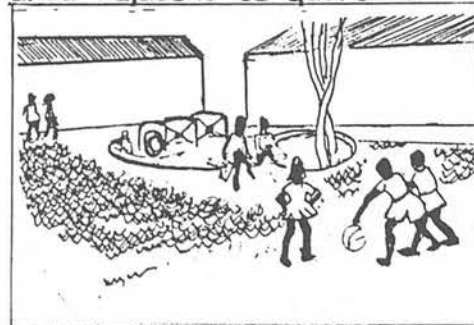


# 6 CHILDREN PLAYAREA

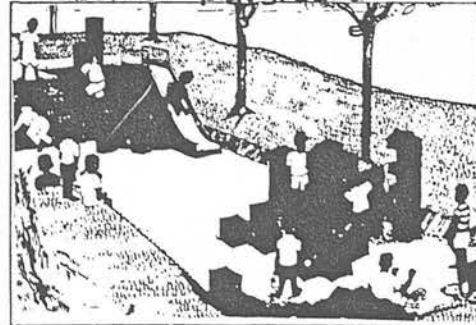
on the road



area adjacent to quarters



elaborate playground



## DATA PROCESSING

The completed questionnaires were coded and checked in detail in the normal way. After the data had been put onto cards, they were submitted to detailed computer edit check, and all errors arising were corrected. The tables quoted in this research were all produced by computer analysis using the Statistical Package for the Social Services.

The study was designed with the expectation that attitudes would be related to the degree of urbanization (city size) of the community nearest the Barrack. A comparison of separate correlation matrices for rural, urban and metropolitan respondents revealed no significant correlational differences. In view of these similarities, all three urbanization levels were subsequently analysed together. The similarity among rural, urban and metropolitan respondents indicates that conclusions can be based upon the total sample without regard to urbanization levels. This is not to say, however, that attitudes were identical at every Barrack.

## RESULTS

Tables referred to throughout, appear in Appendix II.

### HOUSEHOLD COMPOSITION (Tables III and V )

About 80% of the sample was found to be married and as expected, the number of dependants outnumbered the personnel by about four to one. With an average of 4.65 persons per household.

Children under school age (C1) accounted for 29.5% of the total strength in the sample, while primary school age children (C2) accounted for 21.8% and post primary (C3) 8.8%. The adult strength (A) was 39.9%. From the cumulative percentage it is shown that children accounted for 60.1% of the total strength and this is indicative of the youthfulness of the community and the need for the provision of facilities to cater for this group within the Barrack.

### EDUCATIONAL LEVEL ATTAINED (Table II)

Data on the educational attainment of the respondents are presented in Table II. Two percent of the sample had no formal education. Of the educated respondents, the bulk of them - 64 per cent - had only attempted or had completed primary education, while 32 per cent have had secondary education or its equivalent. Only 1.4 per cent have had a post secondary diploma education or its equivalent.

### NUMBER OF BEDROOMS IN QUARTERS (TABLE VII)

The inadequacy of accommodation appears to be matched by the presence of severe overcrowding measured by the number of bedrooms occupied by households. There is a distinct concentration of households in one bedroom. A surprisingly high proportion, 87.1% had one bedroom, while only 12.9 per cent of the sample had two bedrooms for their use.

Further emphasising the prevailingly high level of congestion was the fact that households of all sizes were found occupying one bedroom. Thus 19% were single-member households, 14% were two-member (mostly newly weds), 16% three-member, 15% four-member, and 36% were five or more in the household.

#### HOUSING FACILITIES

Facilities available for the use of household members in their quarters varied both in quality and quantity. Thus Table IX shows that 38% shared toilet/bathroom facilities, while 62% of the sample had the exclusive use of one each. 12.2% still share their kitchen with other households (Table X). With the 87.8% who had the use of kitchen to themselves, the main criticism about the kitchen was its location. The majority of the households use either kerosene stove or firewood to do their cooking, while the kitchen was designed for the use of electric cooker. The Army doesn't issue electric cookers and the soldiers are not used to that system of cooking, neither did they consider it necessary. In Nigeria and most African houses, the kitchen is a separate building and cooking is often done in the open court. It is therefore not surprising to find that some households in the Barrack did their cooking outside. In most Nigerian cultures there is the ritual of washing hands before a meal and the men eat first while women and children eat later or while the man eats in the parlour, the women and children eat in the open backyard verandah.

Data on other facilities were also collected during the interview. There was no storage space provided in the quarters of any of the respondents in the interview and over 87% expressed difficulty in storing both military and personal property (Table XI).

There was no washing or drying space provided either. About 68% use the space adjacent to their block for washing, while 30% use their bathrooms (Tables XIII and XIV). Over 85% consider washing and drying a problem (Table XV). Asked why, majority claimed that it was a major source of quarrels between their wives and subsequently bad feelings between themselves.

There was no provision for private outdoor space, be it front or backyard. It was therefore not unexpected when over 99% expressed their desire to have a private backyard. Most of the respondents gave privacy as the main reason for their desire for a backyard, with comments like "at least my neighbour will not always know what goes on in my house".

#### POSSESSION OF HOUSEHOLD EQUIPMENT (TABLE XVII)

The fan was the most popular item owned by most households, with 93.2% owning one. Next was the Radio Cassette recorder which 80% had. Television sets were owned by 65.8% of the respondents. 45.4% had Record players, while 43.7% had refrigerators.

#### INTERPRETATIONS

##### SATISFACTION AND EXPECTATION

Scales were developed to measure satisfaction with existing Barrack housing and its environment as well as expectation (importance) associated with an ideal Barrack housing environment. Respondents were asked how satisfied they were with existing housing and its environment generally, and with different attributes as they exist using the previously described 5-point scale ranging from "very satisfied" to "very dissatisfied".



They were also requested to rate different attributes in an ideal Barrack housing on a 4-point scale ranging from "very important" to "not important".

Satisfaction is being used here as an indirect measure of the general quality of the existing housing and its environment, and that dissatisfaction suggests that certain attributes which make the Barrack livable maybe missing from it. In a question of this kind, there can be doubt as to whether the respondents were distinguishing between an attitude of satisfaction with the Barrack housing and its environment and an attitude of satisfaction with the Military life as whole. Detail examination of responses to why the respondents felt the way they did about the existing Barrack environment and the detail responses to the attributes of the existing housing are sufficiently different to suggest that the soldiers did indeed discriminate between their attitude toward the existing housing and its environment.

Of the 295 respondents, 71.9% were either dissatisfied or very dissatisfied with the existing Barrack environment generally. Another 26.4% were indifferent. Only 1.7% expressed positive satisfaction about the existing Barrack environment (Table XXI). On the other hand 50.2% were either dissatisfied or very dissatisfied with the existing housing, while 34.9% were positively satisfied and 14.2% remained indifferent.

#### EXISTING HOUSING ATTRIBUTES

In expressing dissatisfaction or indifference towards existing housing attributes, the layout of rooms attracted the largest number of respondents. 93.8% of the respondents were either dissatisfied or indifferent to the layout of rooms in the existing housing, and only 6.2% expressed positive satisfaction with it (Table XXVI).

In particular the positioning of the toilet/bathroom such that access to it is only gained through the bedroom. This was considered to be an invasion of the occupants' privacy since it is the only toilet in the quarters and any visitor received who wants to visit the toilet has to go through the bedroom. Furthermore, during the night, members of the household who sleep in the living room intrude on their parents' privacy during the course of visiting the toilet at that time. The majority consider this undersirable and would prefer a layout where each room in the house has a direct access to the toilet and bathroom.

Only 11.2% expressed positive satisfaction with the toilet/bathroom facility, while 88.8% were either dissatisfied or indifferent (Table XXVII). In the existing quarters, they are both in one small room. Criticism centred on the positioning and the fact that they were not separated rather than on the lack of space to manoeuvre in, when inside to have a shower. The bedroom had only 16.6% of the respondents positively satisfied and 83.4% either dissatisfied or indifferent (Table XXII). Criticism centred both on size and number. The appearance of the existing quarters was satisfactory to 30.2% of the respondents, while 69.8% were dissatisfied or indifferent (Table XXII). The kitchen size was satisfactory to 47.2% of the respondents but its location in the existing quarters was criticised. 52.8% were either dissatisfied or indifferent to it (Table XXV). Again the size of the living room or parlour was satisfactory to 49.5%, while 50.5% were either dissatisfied or indifferent to it (Table XXIV).

#### EXISTING BARRACK ENVIRONMENT ATTRIBUTES

Among the attributes of the existing Barrack environment considered for evaluation, a high number of respondents seem to consider privacy from neighbours as unsatisfactory. While only 5.5% expressed positive satisfaction, 90.8% were dissatisfied (Table XXXVI). This trend was also indicated about recreational facilities, 93.2% were dissatisfied with its provision within the Barrack. (Table XXXVIII). The layout of housing blocks was considered satisfactory by only 1.0% and 90.8% were dissatisfied with it (Table XXXVII). Other attributes considered unsatisfactory by more half of the respondents include: maintenance, landscape, and refuse collection. A high number of respondents expressed their indifference to the existing public transport and fire protection measures. 81.7% were indifferent about public transport (Table XL), and 76.2% for fire protection. In evaluating the existing market/shop, only 0.7% of the respondents expressed positive satisfaction, 42.7% were dissatisfied, while 56.6% remained indifferent (Table XLII).

#### IDEAL HOUSING ATTRIBUTES

Respondents were asked to indicate the type of Barrack house (quarters) they would most prefer to occupy (Table XIX). The semi-detached house type was by far the most popular. Most of the respondents considered the detached house type to be meant for Officers. 70.2% of the respondents preferred the semi-detached house, 25.8% wanted the detached house, and 3.7% preferred the block of flats.

Indications are that the respondents had some clear ideas of the important attributes that an ideal Barrack housing should possess such that their preferences were not simply reflections of existing dissatisfactions. Of the 295 respondents, the number that considered storage space and backyard very important in an ideal Barrack housing was higher than for any other attribute (Tables XXXI and XXXIV).

Other attributes considered very important by more than half of the respondents were bedroom size, layout of rooms and Barrack housing appearance (Table XXX, XXXIII and XXVII). Living room size, kitchen and children play space came next. The relationship between an attribute being considered unsatisfactory or satisfactory in existing housing and its being considered very important in an ideal housing is essentially similar to the responses on the attributes of Barrack environment. A majority of the respondents who considered an attribute very important in their description of the ideal Barrack housing did not necessarily comprise a majority of those who found the attribute unsatisfactory in the existing Barrack housing.

The probability of considering an attribute very important in an ideal housing was higher among those whose existing housing were rated unsatisfactory in that particular attribute than among those whose existing housing were described as satisfactory. For example, 130 of the 242 respondents who considered Bedroom size very important thought that their existing housing was either satisfactory or were indifferent about the attribute. However, 80% of respondents who judged their existing housing unsatisfactory in terms of layout of rooms considered this to be very important in the ideal housing, compared to 50% among those who judged their existing housing to be satisfactory. The three most very important attributes for an ideal Barrack housing are also, one of the most important unsatisfactory attributes and two missing attributes in the existing Barrack housing, namely layout of rooms, storage space and backyard.

#### IDEAL BARRACK ENVIRONMENT ATTRIBUTES (TABLES XLV TO LIV)

From the ratings of the attributes, the number of respondents considering an attribute very important in an ideal Barrack Environment ranged from a maximum of 252 for privacy from neighbours, to 57 for children play ground. Six of the attributes were considered very important by a majority of the respondents and four by less than the majority. Attributes considered very important in an ideal Barrack Environment include: privacy, maintenance, recreational facilities, layout of buildings, fire protection and shops/market. Clearly then, those attributes considered as important in an ideal Barrack environment can be classified as conveniences. Attributes such as children's playground, public transport, landscaping and refuse collection are seen as conveniences. The next major issue was the impact of the existing Barrack environment, particularly with regard to unsatisfactory attributes, upon the attributes described as very important in the ideal Barrack environment. Generally, there has been little effect. For example, from the respondents who considered fire protection very important in the ideal Barrack environment, 68.9% considered fire protection either satisfactory or were indifferent in the existing Barrack environment. Similar results were seen with regard to all other attributes rated very important by a majority of the respondents, with the exception of privacy, layout of building and recreational facilities. In these three cases, the majority of the respondents who considered the attributes very important in the ideal Barrack environment, considered them unsatisfactory in the existing Barrack environment.

These data seem to indicate that the respondents' preferences were not simply reflections of existing dissatisfactions or replications of the existing situation.

However, the probability of considering certain attributes as very important in the ideal Barrack environment was higher among those who consider the same attributes unsatisfactory in the existing environment. For example, 82.60% of those who considered fire protection unsatisfactory in the existing Barrack environment considered fire protection very important in the ideal Barrack environment, compared to 68.9% among those who considered fire protection satisfactory in the existing Barrack environment.

What has emerged is an apparent level of general dissatisfaction with the existing Barrack housing and its environment. Because of lack of research into the attitudes of soldiers towards their housing and environment, there is no way of knowing whether this is typical or not. Certainly there is a need for further investigation into soldiers' attitudes.

#### RELATIONSHIP BETWEEN THE SOLDIER'S EDUCATIONAL ATTAINMENT AND HIS ATTITUDE TO THE EXISTING BARRACK HOUSING (TABLES XVIII and II)

The finding with regard to satisfaction in relation to education display a significant relationship between the two variables. Higher educational level is associated with reduced satisfaction with the existing Barrack housing. For example, from the computer analysis, 82% of the respondents who attained the secondary education or equivalent level were either very dissatisfied or dissatisfied with the existing Barrack housing, while only 34.2% of the respondents with primary education or its equivalent were either dissatisfied or very dissatisfied with the existing Barrack housing. On further analysis, the relationship was still found to be significant. These findings would appear to justify the conclusion that the soldier's attitude to the existing Barrack housing is a function of his educational level.

X



PRIORITY EVALUATION GAME (Table LVI)

Data gathered so far concerning the soldiers has been obtained by means of a social survey. The results show an almost consistent pattern - The soldiers prefer a semi-detached house with storage space and backyard that provides privacy for the out of door activities within the household. They are asking for their traditional way of life to be incorporated in the design of the Barrack housing. This lends support to the arguments that house form is not simply the result of physical forces or any single casual factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms. Socio-cultural forces are primary, and others secondary or modifying.

There is obviously a hierarchy of importance attached to the expectations of soldiers. To explore the role of choice in the decision making process the priority evaluation game effectively allows the soldiers to choose the nature of housing they expect will be provided in the ideal Barrack housing. This simple game is aimed at establishing the order of importance. There are clearly more aspects but those used were arrived at from the result of the first pilot survey. The soldiers were being asked to trade an aspect of the ideal Barrack housing expectation against another in order to establish a priority for Barrack housing.

It must not be forgotten that some of the constraints that might affect a civilian in his choice of housing may not necessarily be a constraint to the soldier. For example, the role of the journey to work as a determinant of residential location with the civilian. Clearly from the result, a separate store room, a backyard, and an additional bedroom appear to be uppermost in the soldiers' priority.

The separation of the WC and shower is equally a priority. There was an overwhelming response in favour of the semi-detached house, certainly compared to the multi-family or detached houses. What is most significant though, is the fact that every respondent seemed to have spent a point or two to acquire a yard and to acquire a storage space, which means none accepted the zero level in those two categories. The yard or backyard is the centre of activity for the family life in the Nigerian society. Thus, the soldier seems to attach great importance to this socio-cultural element and expects it in the ideal Barrack housing. The priority evaluation game has thus identified what is desirable among the majority of the soldiers. What the soldier seem to be saying is that though training, structure of the organisation, equipment, operational conduct and technology is similar to those of the Western World and the rest of the World, Barrack housing does not have to be in order to be efficient. They want their socio-cultural background incorporated in Barrack housing.

The result lend support to the assertion that people take little interest in their environment until they are reasonably satisfied with their house.

## IMPLICATIONS

### SOLDIERS' FAMILY

The military establishments have undergone a demographic transformation. The military has gradually shifted from an institution in which a majority of the personnel were single to one in which the majority were married. For example, out of our sample survey, 80% were found to be married. Basic trends reflect the development in the larger society: the percentage of persons living in family units has increased. Nigeria's population in 1963 was put at 55.7 million and it is estimated to be over 100 million today. With an all-volunteer service, the military is faced with a serious lack of qualified personnel recruitment. Since personnel are being recruited into a highly familistic environment, the military have got to offer benefits which allow them to compete with civilian sector for manpower and make them particularly attractive to men with families. The military is dealing not only with families but also with relatively young families.

Considering its importance as an institution, the family has not received its due in the Barrack environment. As Vincent<sup>17</sup> points out, the family more than any other major social institution facilitates social change by adapting its activities and structure to the changing needs of other social institutions and to the society at large. Nonetheless, the family has usually been taken for granted, and efforts to gain recognition and support for it in policy decisions have normally been treated with indifference. For years, policy toward and research on the family within the Military is virtually non-existent.

17. C.E.Vincent "Mental health and the family" in P.H.Glasser and L.M.Glasser Editors Families in Crisis (new York: Harper and Row, 1970) p.200.

However, as the survey results show, the proportion of married to unmarried soldiers has risen to such a level, the military must begin to revise its thinking on the subject. With over 80% of the personnel married, the military should therefore respond appropriately with a full range of family community services. Further, in recognizing that it cannot afford to compete with the family for a soldier's loyalty, the military must make concerted efforts to make the living conditions of the soldiers' family within the Barrack more satisfactory.

The case for continued and even greater consideration of family in military policy making and Barrack Housing is a convincing one. First, it stands to reason that a contented family life will bolster a soldier's morale, while men who are experiencing family problems will have lowered efficiency on the job. Christie<sup>18</sup> found, for example, the United States Army recruits who were married adjusted to military service much better when given greater contact with family and friends. It is also inefficient to train men for a job and have them leave the service, and it is estimated that many men do so because of an inability to arrive at a satisfactory family adjustment within the military context.<sup>19</sup> In fact Owens<sup>20</sup> found a number of family related variables to be important for personnel considering re-enlistment in the Australian Army.

18. R.Christie "Changes in authoritarianism as related to situational factors" in American Psychology 7 (1952),pp 307-308.
19. C.H.Coates and R.J.Pelligrin, Military Sociology: A Study of American Military institutions and military life (Baltimore: Social Science Press, 1965) p.106.
20. A.Owens, "Job satisfaction and re-engagement among Australian regular army soldiers" in Australian Journal of Psychology, 21 (1969) pp 137-144.

The importance of the family for AWOLs (Absent without leave) was demonstrated by Hartnagel,<sup>21</sup> since over half the AWOLs he studied were "family problem solvers" who had gone AWOL in order to correct family problems or to alleviate family-related financial difficulties. Attempting to deal with such disciplinary problems through traditional means - such as extra duty, restriction, loss or reduction in pay - certainly won't raise the soldier's morale and will have a cumulative negative effect on him and his family. All the while, combat readiness suffers further while the Commanding Officer, Company Commander and Company sergeant-major have to divert their attention to dealing with personal problems rather than training and maintenance - with possible negative impact on the health and welfare of their own families. This is a vicious circle, a problem very much in need of solution.

During the survey, a majority of the respondents expressed their readiness to undertake any task asked of them as long as their families' situation is satisfactory. This attests to the protectiveness and importance that many Military personnel feel for, and attach to, their families.

21. T.F.Hartnagel, "Absent without leave: A Study of the Military offender" in Journal of Political and Military Sociology 2 (1974) pp 205-220.

## OVERCROWDING IN BARRACK HOUSING

From the survey sample, the high level of congestion was emphasised by the fact that households of all sizes were found to occupy one bedroom house. Biologist Jack Calhoun<sup>22</sup> argues that among rats, a certain level of density will result in such overcrowding as to paralyse their social system and result in depression, conflict and eventual destruction of the rat population. Calhoun seems to have taken the findings of animal research to suggest that such absolute factors do control human behaviour. Before this argument can be taken, however, it is necessary to determine whether the findings of research on animals are transferable to human beings; whether higher densities will also have destructive affects on people. Such findings cannot always be transferable, because the relationship of rats to their environment is different from that of people to theirs. Rats and other animals make the direct use of the natural environment, it provides them with food and shelter. Most human beings do not make such direct use of the natural environment; they transform it into a man-made environment, adding the function and meaning which Herbert Gans<sup>23</sup> called effective environment. Until the findings of research among rats are tested systematically among people and among people with direct and indirect relationships to their environment, it is futile to argue that high density is always undesirable.

Even so, some types of density may always be as bad for people as for animals. As in the case of the early Barrack rooms in the British and Colonial armies where there were reported cases of epidemic diseases.

22. J.B.Calhoun, Population Density and Social Pathology, in Scientific American 206 (1962) pp 1139-146.

23. Herbert Gans, People and Plans (London: Basic Books, 1968) p.40.



## PRIVACY

It did not come as a surprise when over 85% of the sample expressed privacy as one of the most important attributes in an ideal Barrack housing environment. The same desire is expressed by soldiers everywhere. For example, in Britain<sup>24</sup> and America, this is particularly true in the case of unmarried soldiers who are still housed in 10-12 man brick or flat. Schwartz's<sup>25</sup> essay shows that designing in terms of both community and privacy is based on sound sociological theory. He makes the point that privacy has important positive functions in personality development and that the chance to withdraw from the group also makes the individual more effective when he returns to active participation in group life. He discusses numerous examples from the research literature to indicate that when privacy disappears the maintenance of harmonious social relations among peers is threatened, and that it is also essential for the preservation of authority and efficiency in social structures that are organised on hierarchical principles. It is well known that the military has used privacy to maintain the status division within it by separating the officers' quarters from the soldiers' quarters and most of the very senior officers (e.g. Generals) have quarters away from the military establishment. In organisational life the privacy of the upper ranks is ensured structurally; for example, in a regiment, it is necessary to see the adjutant (most likely a lieutenant) before getting to the Commanding Officer (in most cases a Lieutenant Colonel). In contrast, the soldiers, enjoying less control over those who may have access to them, find their privacy more easily invaded.

24. Director of Works (Army), The Modular Suite, (June, 1983)

25. Barry Schwarz, The Social Psychology of Privacy, in American Journal of Sociology 73 (May, 1968) pp 741-752.

Withdrawal into privacy is often a means of making life with an unbearable person possible. If the distraction and relief of privacy were not available in such a case, the relationship would have to be terminated if conflict were to be avoided. Excessive contact is the condition under which Freud's<sup>26</sup> principle of ambivalence most clearly exercises itself, when intimacy is most likely to produce open hostility as well as affection. Homan's proposition, "Persons who interact frequently with one another tend to like one another",<sup>27</sup> providing the relationship is not obligatory, holds generally, but misses the essential point that there is a threshold beyond which interaction is unendurable for both parties. It is because people frequently take leave of one another, that the interaction-liking proposition maintains itself.

However, the concept of privacy is an extremely<sup>e</sup> complex one and is not merely a question of physical distance between homes, the position of windows and so on. It is very much concerned with relationships between people. There are many degrees of privacy. There is privacy within the house, privacy in regard to other people such as neighbours, and the physical privacy of not being overlooked. In high density Barrack housing conditions, privacy from other members of the family for basic human functions is the most important priority.

26. Sigmund Freud, Group Psychology and the analysis of the Ego (New York: Bantam Books, 1960) pp 41-42.

27. George C. Homans, The Human Group (New York: Harcourt, 1950) p. 111.

#### DESIRED HOUSE TYPE

The data from the survey shows that the semi-detached house was by far the most popular choice in considering the house type preferred. This is significant in that, despite the soldiers' desire for privacy, as shown previously, they want the traditional pattern of family life in the larger community where they come from. This means that the privacy required is not in the sense of having a detached house surrounded by gardens at a distance from the next house.

This communal pattern of living in the Nigerian Society, requires for comfort a large, enclosed yard, where the household can cook, gossip, do their house-work and even work at their trade. In a tropical climate, in dry weather, it is always more comfortable to be outdoors. The yard becomes the centre of life of the house. The open space, especially if the roof projects over it, creating what is referred to as a verandah, also makes it much easier to provide for visitors, since sleeping mats can be unrolled on the verandahs. Open hospitality is an obligation of Nigerian social life, and the living space must be flexible enough to make visitors welcome. At the same time, if a group of related households are to live together under one roof, they must each be able to reach their own rooms without continually intruding on the other's privacy. One reason, therefore, why the respondents in the survey complained of overcrowding though they might have lived together contentedly in as little space before joining the Army, is because each Barrack house was planned under one roof, one room opening off another or off the toilet.

The design of the Barrack housing referred to in the survey repudiates uncompromisingly the traditional pattern of residence in the larger society.

The neglect of traditional pattern may have serious results. Charles Abrams was one of the first to realise this point and to deal with it in connection with built environments and the house. He comments in his work how experts and officials deplore traditional solutions in spite of their clear social and climatic advantages. From the analysis of the data collected, the soldiers' attitude has shown that traditional attributes in Barrack housing may therefore be much more acceptable - if not desirable - than has been assumed.

## CONCLUSION

The Military is the only organisation that counts its strength in terms of men rather than machines. Instead of a plane or a ship, Man is the basic factor. Man is the military's weapon system. He is the prime mover. Modern arms and equipment - the best that can be provided - are essential, but they are secondary to the morale, courage, skill and brains of the fighting soldier. This is as true today with soldiers as it was in the days of the Roman Legion. No matter how sound an aim a Commander selects, he will not succeed unless his men have the skill and the will to carry his plan through. So his men must be well trained and capable of co-operating as a team. As well as possessing skill-at-arms, his men must be well administered, physically fit and imbued with a high morale, for in the end the achievement of success will depend upon the human factor. Maintenance of high morale involves the satisfaction of the individual soldier's needs and those of his family. The provision of adequate Barrack housing is thus a move towards satisfying these needs, which improves his morale and creates an environment conducive to the proper performance of his military duties.

The findings of this study show dissatisfaction with the existing Barrack housing. There is little or no available literature on the subject and the views of the actual users of the Barrack housing have not been considered by architects, planners and the military authorities. Therefore in assessing soldiers' housing attitudes and expectations, more evidence is needed from soldiers in Nigeria and elsewhere. Few architects have the time, energy and resources to collaborate with military specialists to translate the new ideas in military thinking into effective building design.

This collaboration is most desirable and is beneficial to both the designers and the military authorities.

The ability of designers to design future barracks which satisfy soldiers' needs depends on a thorough knowledge of the preferences of the soldiers already living in Barracks. It has been established that the existing Barracks housing do not fully cater for needs beyond the basic necessities required to accommodate a fighting force. The number of dependents living within the Barrack have greatly outnumbered the soldiers. One of the problems designers face is that of establishing just what the soldiers want from their housing; they (soldiers) have not always been in a position to press for their requirements to be met, and sometimes were not capable of articulating what they need and appreciate although it was essential, from their point of view, that their needs are expressed. The development in technology has forced a lot of changes within the soldiers' community. The structure of the organization and the relationship between the members of the hierarchy have been affected by this change. No-one lives in a static, unchanging society, and this includes the military organization.

The Generals most popular with the men were those who did most for their health and welfare. One such was Sir Charles Napier in India. He had a special interest in providing the soldiers with decent Barrack. He argued that the number of men in a room should be governed not only by the floor area, but by the cubic capacity also, so that each man should have not less than 1000 cubic feet (28.3 cubic metres) of space.



Rooms that were six to eight feet (1.8 - 2.4m ) high received his strongest condemnation. "The stench of a low bad Barrack room in the morning is app<sup>u</sup>alling", he wrote. He ordered them instead to be built 20-25 feet (6-7m) high, with double ceilings and thick walls to keep out the heat and provide good ventilation. He went on "such barracks are expensive no doubt..... So are sick soldiers, so are dead soldiers. But the difference of these expenses is that the first is once and done with, the second goes on increasing like compound interest and quickly outstrips the capital".

There has been some improvement in the Barrack accommodation. For example, in Nigeria up to about a decade ago, over 80 per cent of the soldiers shared sanitary conveniences but today, under 40 per cent share those conveniences. In Britain and America, the number of soldiers accommodated in a room has been reduced from 24 - 30 to 10 - 12, and the married soldier has moved from a one room quarter. In spite of these improvements however, the problem of design for the social, psychological and cultural requirements of soldiers and their families has yet to be satisfactorily resolved.

The army wife, for instance, particularly of the younger soldier, is a captive in her environment due to domestic ties and economic pressures. If she is discontented tensions are created within the family which may give rise to a breakup of the marriage, or the loss of a good soldier who leaves the service in order to find greater satisfaction for his wife in a civilian environment. Although civilian wives when they become mothers, suffer a period of domestic captivity by being housebound, the soldier's wife is held captive by her environment to a much greater degree, with resultant emotional stresses. To understand this problem, it is necessary to consider the average pattern of life of a young soldiers' wife in a Nigerian Barrack.

Upon marrying a soldier, she leaves her family, home roots, place of employment and customary environment. The young wife not only regrets the loss of her personal freedom occasioned by marriage, but in an isolated location, she is unable to relieve economic pressure and satisfy emotional and intellectual desires by returning to employment. Often this is made worse by the relatively high cost of living, lack of shopping facilities, shortage of amenities and lack of space within their Barrack housing. She is in an unfamiliar territory. Unless her husband owns a car (which is highly unlikely) and she is able to drive, she is frequently confined to the immediate locality by the paucity of public transport and high cost of travel. The stresses become more severe when children start to arrive. Not only is there a lack of maternal guidance at anti-natal and post-natal stages, but the wife's family is usually beyond reach to help with the equally important task of child minding following the confinement period. And even if they were, there is not enough space to accommodate any visitor. It is customary in most extended family systems in Nigeria for a member of the wife's family to assist the family with the new baby during the post natal stage. The contentment of soldiers' wives should be given special consideration in order to fortify them against the stresses of separation. By reducing domestic tensions, military efficiency will be improved, and a better type of soldier will be retained in the service.

Soldiers of the past have been reasonably satisfied with their subsistence, shelter, clothing, status and job security. Conditions are changing today, however. Changing values, attitudes and traditions are straining relationship between the military and the soldier. This phenomenon of change is not new, indeed it is inevitable, but it begins to assume an overriding importance as the rate of change in some areas accelerates to points where its effects can no longer be contained.

It therefore follows that if some measure of forethought can be given to the future and preparation made accordingly, change itself will be facilitated and its effects more readily absorbed.

The study must therefore be seen in the light of the changes taking place in the Military. The importance of producing a compatible Barrack housing and environment which incorporates current thoughts, outside the military field, on privacy, personal territory and other aspects of housing design based on the needs and expectations of the soldier, has become imperative. And since design is the function of the architect, his collaboration with the military specialist and the users has also become necessary.

A growing interest in the socio-cultural and psychological forces involved in the development and use of space organisations has led to work on these aspects in a number of places. E.T.Hall<sup>1</sup> was among the first to draw attention to the cultural variability of the use of space, the scale of spaces, needs of privacy, tolerance of noise and overcrowding, and the like. Similarly, in his work on the bathroom, Alexander Kira<sup>2</sup> has pointed out that while the problems of personal hygiene have remained constant, the ways in which people have coped with them have varied widely depending on the beliefs, fears and values which have motivated them at any particular time and place. He gives many examples of different attitudes to privacy, cleanliness, odours and comfort, and suggests that it is such attitudes rather than mere utility which gives insights into, for example, the preference for showers rather than baths and other significant planning decisions regarding personal hygiene.

1. E.T.Hall. The Silent Language (Garden City New York:Doubleday 1959) p.54, The Hidden Dimension(Garden City N.Y.:Doubleday 1966) pp 30-40.
2. Alexander Kira, The Bathroom (New York: Bantam Books 1967) pp 138-151.

In attending to the implications of depth psychology for environmental design, two questions are, in effect, being asked. The first is whether or not there are any personality needs that are specifically environmental, in the sense that they are best satisfied by the provision of a physical object rather than a social pattern. The second issue is to determine whether or not such needs, if they exist, are universal, that is to say, characteristic of human organism, regardless of the cultural or social setting in which he lives. One of the few such personality needs to have been identified thus far is the need for personal space. Personal space is usually defined as an area with invisible boundaries surrounding a person's body into which no one may intrude.<sup>3</sup> It is sometimes described metaphorically as an invisible snail shell, a soap bubble, or breathing room. The need to maintain such a space is apparently deeply rooted in the human personality, even though the volume of space varies between cultures and for different persons and situations in the same culture.

The concept of personal space has been utilised in the design of many types of small scale, intimate, environments, including dormitory rooms, school classrooms, mental hospital wards and park benches. Investigators like Goffman<sup>4</sup> and Sommers<sup>5</sup> have described the effects of intruding into personal space that surrounds each individual. However, this should not be confused with territoriality which is the need of individuals and groups to claim some geographical area as their own, this is another need of the human personality that can best be satisfied through the provision of specific environment or spatial conditions. The specific environmental condition that can fulfill this need is the availability of a fixed, circumscribed area, which the individual or group has the capacity to control.

3. See Robert Sommers, Personal Space, the behavioural basis of design (New Jersey - Prentice Hall, 1969).

4. Erving Goffman, Behaviour in public places (N.Y.: the free press 1963) p.35.

A territory, because it is a fixed area, can be said to exist even when the individual identified with it is not physically present. Territory thus differs from personal space, which is something an individual carries around him.

Most discussions of the concept of territoriality note that it was first developed to explain the spatial behaviour of animals. As a consequence, the application of the concept to human behaviour has usually proceeded by crude analogy, and thus people have tended to overlook the fact that concern for territory and the response to its invasion are linked to the symbolic and cultural dimensions of human psychology as well as to the biological. Lyman and Scott<sup>6</sup> make these connections clear. Territoriality is by definition a spatial phenomenon, but the way its boundaries are defined, the uses to which it is put, the manner in which groups cope with invasions, and the consequences of territorial deprivation for social order are all highly variable. They (Lyman and Scott), for example, distinguish four different types of human territories (Public territories, home territories, interactional territories, and body territories); three types of territorial encroachment (violation, invasion and contamination); and three types of reaction to encroachment (turf defense, insulation and linguistic collusion).

5. Sommers, Personal Space pp 39-57.

6. S.M.Lyman and M.B.Scott."Territoriality: A Neglected Sociological dimension', in Social problems 15, No.2 (1967) pp 236-249.

The concept of territoriality offers a fruitful explanation for the soldiers' desire for what amounts to a home territory. Lyman and Scott's discussion is redolent with implications for housing and urban design. Especially interesting is the distinction they make between public territories, which are accessible to all citizens but in which users are under public scrutiny and must conduct themselves according to official norms, and home territories, which are private areas in which users are relatively free to behave in their own individual fashion. Universally, the soldiers have expressed a demand for more privacy, for small scale facilities and domestic comforts, and for the means to keep the trappings and evidence of military life away from domestic areas. They (Lyman and Scott) mention that the need for a home territory can be met through erecting walls and doors, but that invaders can also be excluded by the confusion of odd gestures, strange ethnic dialects, and other manifestations of linguistic collusion. What is happening in the Barracks where our survey was carried out is an example of the conversion of public territories to home territories. The soldier has converted the open area around their Barrack blocks into cooking areas, washing and drying areas, play areas for their children and store for those items that they have no space for in the quarter. In trying to defend this new home territory acquired, quarrels have arisen between the various occupants. This has been detrimental to the morale and cohesion required in the group.

The concept of "personal space realm" or "personal territory" provides a clue to yearning for privacy by most soldiers. The soldier wants to establish a unique home territory that is fixed in space and that is the locus of those activities most important to him.



The quarter is the focal point of private and semi-private activities. It is the soldiers' home territory. When personal territorial characteristics are not available, problems result.

Control over personal territory is of special importance in a Barrack environment, the recruit overwhelmed by the impersonal nature of the Barrack, needs some kind of place to identify with and hand<sup>g</sup> his helmet in.

There is some evidence that in circumstances that require the individual to adapt to drastically altered cultural settings, "home" and its amenities assume ever greater importance than when the social and physical environment is familiar.<sup>7</sup> Perhaps the greatest single deterrent to adequate privacy is sharing less than 18 square metres of space with someone else for 35 weeks. Clashes between incompatible roommates appear commonplace, and probably affect a student's approach to his work. Over half of the students interviewed simply said "I can't stand ~~my~~ roommate".<sup>8</sup> Sleep, study and intimacy are activities which require personal territory, while other needs may be met by degrees of Common space.

Another related source of irritation where there is lack of personal territory, comes from wanting to protect one's possessions. There have been a number of cases of theft, of both personal and military property; this can destroy the feeling of security in the personal environment. Soldiers today, as we have already established, have more kit and private possessions than in the past; they will need to protect these.

7. Sim van der Ryn and Murray Silverstein, Dorms in Berkeley: An Environmental Analysis, Centre for planning and development (Berkeley : UC press 1967) pp 31-34.

8. Van der Ryn and Silverstein, Dorms in Berkeley, p.33.

Evidence collected from the analysis of the data shows that the soldiers have expressed the importance they attach to their privacy and their living quarters reflecting the social and cultural milieu they all belong to, a preference they share irrespective of rank.

#### Social Cohesion

Interest in the impact of architecture on group cohesion, community development and worker morale first emerged in the late 19th century in response to growing public anxiety over the violence and disorder of urbanized society of the Western World. Higher population densities, the destruction of peasant and farm life, and the separation of home and work were seen as forces that were breaking up the basic social relationships that held cities together. It is this problem that the military - which hitherto had a close-knit community - now faces.

One of the principal interests of environmental designers today is the role that architecture can play in fostering social interaction. When architecture is considered in terms of the goal, the aspect of the built environment that is usually examined is spatial organization. That architecture does have some influence on social interaction cannot be disputed. A building, or a group of buildings, has the capacity to serve as a communications network. The arrangement of rooms, walls, doors, partitions, driveways and streets affects the opportunities people have to see and hear each other and thus to respond to one another. One way of thinking about a building is as a catalyst; a relatively inert agent, but one vital to a particular process - such as the social interaction of various groups within the military. However, if the building is a catalyst, it is one which differs in a very important respect from the catalytic agents of chemistry which facilitates only one kind of reaction between substances.

The building, may facilitate many reactions. For example, common facilities for all ranks or units within a Barrack, mean that there are more opportunities for inter-rank and unit contacts off duty than if there were separate ones. The result of these interactions must be studied both from the personal, social and military points of view. The individual's potential social world is widened and inter-unit working is facilitated by such informal contacts.

Finally, the findings of this research have some important implications for design and planning decisions. It provides further evidence in support of the notion that the preferences for home and neighbourhood designs are reflections of a variety of social, psychological and cultural factors. An individual's satisfaction with his dwelling is generally related to his degree of satisfaction with his neighbourhood. This emphasizes the fallacy of policies geared to designing acceptable housing without considering the social environment or context of the housing. Furthermore, an individual's dissatisfaction with his dwelling is generally associated with his level of education. The more educated he is, the more critical he becomes of his dwelling and environment. The more educated soldiers prefer Barrack housing arrangements that are semi-detached with private backyard. The need for an individual to maintain his identity and autonomy is reflected in the preferences for solutions that permit this within the dwelling as well as the need for a territorial extension beyond the dwelling.

There has been a shift from a predominantly unmarried to a married military community, and the protectiveness and importance that Soldiers feel for and attach to their families is very evident. The Military can avoid the collision between the Soldier's loyalty to his family and his loyalty to the Military by creating an environment which nurtures his aspirations.

## BIBLIOGRAPHY

The following bibliography lists all unpublished and published sources listed in the thesis.

### A. BOOKS

- |  |   |
|--|---|
| Abrams, Charles                                    | <u>Man's Struggle for Shelter in an Urbanizing World.</u> Cambridge:MIT Press, 1965.            |
| Ahmadu Bello, Alhaji Sir<br>the Sardauna of Sokoto | <u>My Life.</u> London: Cambridge University Press, 1962.                                       |
| Ajayi, J.F.A., and<br>Crowder, M.                  | <u>History of West Africa.</u> London: Longman. 1974.   |
| Andrzejewski, Stanislaw                            | <u>Military Organisation and Society.</u> London: Routledge & Kegan Paul, 1954.                 |
| Atkinson, Captain J.                               | <u>A.B.C. of the Army.</u> London: Gale & Polden Ltd. 1910.                                     |
| Back, Kurk W.                                      | <u>Slums, Projects and People.</u> Durham: Duke University Press 1962.                          |
| Baker, Roger G.                                    | <u>Echological Psychology.</u> Stanford: Stanford University Press. 1968.                       |
| Bamfield, Veronica                                 | <u>On the Strength: the Story of the British Army Wife.</u> London: Charles Knight, 1974.       |
| Bauer, Catherine                                   | <u>Social Questions in Housing and Town Planning.</u> London: University of London Press. 1952. |
| Baynes, John                                       | <u>Morale: A Study of Man and Courage.</u> London: Cassell & Co.Ltd.1967.                       |
| Baynes, Lt-Col.J.C.M.                              | <u>Soldiers in Modern Society.</u> London: Methuen,1972.  |
| Bidwell, Shelford                                  | <u>Modern Warfare.</u> London: Allen Lane 1973.   |

Breeze, David J., and  
Dobson Brian

Canter D., and Lee T.

Chermayeff, Serge, and  
~~Alexander, Christopher~~

Coates, Charles and  
Pelligrin, Roland

Cullingworth, J.B.

Daalder, H.

Duffy, Christopher

Edwards, Major T.J.

Festinger, L.Schachter,

Frazer, R.W.

Freud, Sigmund

Gabriel R.A. editor

Gabriel, R.A., and  
Savage P.L.

Gans, Herbert

Glass G.V.,

The Army of Hadrian Wall. Fifth  
edition. Newcastle-upon-Tyne:  
Frank Graham, 1978.

Psychology and the Built  
Environment:  
London: Architectural Press. 1974.

Toward a New Architecture of  
Humanism:  
Country and Privacy. Middlesex:  
Penguin, 1966

Military Sociology. Baltimore: Social  
Science Press 1965.

Problems of an Urban Society: the  
Social Content of Planning. London:  
George Allen, 1973.

The Role of the Military in the  
Emerging Countries.  
The Hague, 1962.

The Army of Frederick the Great  
London: David and Charles 1974.

Military Customs. Aldershot:  
Gale and Polden, 1961.

Social Pressur<sup>e</sup>s in Informal Groups:  
A Study of Human Factors in  
Housing. New York: harper and  
Bros. 1950.

Mansfield on the Conditions of the  
Western Forts 1853-84.  
Oklahoma: Norman, 1963.

Group Psychology and the Analysis  
of the Ego. new York: Bantam Books  
1960.

Fighting Armies: Non-Aligned, Third  
World, and Other Ground Armies,  
A Combat Assessment. London:  
Greenwood Press, 1983.

Crisis in Command:  
Mismanagement in the Army  
New York: Hill and Wang, 1978.

People and Plans London : Basic  
Books, 1972.

Basic Statistics for the  
Behavioural Sciences: London:  
Prentice-Hall 1978.

- Grant, R.A. et al Local Housing Needs and Strategies HMSO 1976.
- Hall E.T., The Hidden Dimension. New York Doubleday 1966.
- Hall E.T. The Silent Language. New York: Doubleday 1959.
- Hackett, General Sir John The Profession of Arms London: Book Club Associates 1983.
- HARGREAVES J.D. 'The European Partition of West Africa' in Ajayi J.F.A., and Crowder M., editors, History of West Africa, London: Longman 1974.
- Haywood, Colonel A., and Clarke, Brigadier F.A.S., The History of the Royal West Africa Frontier Force. Aldershot: Gale and Polden, 1964.
- Heathcote, T.A., The Indian Army, London: David and Charles, 1974.
- Hodge, Peter The Roman Army, Essex: Longman 1977
- Hole, W.V., 'Key Variables in Social Research in Giffus, E., editor, Housing London: Haineman, 1972.
- Homans, George C. The Human Group New York: Harcourt 1950.
- Huntingdon, S.P. The Soldier and the State Cambridge: Harvard University Press, 1967.
- Hutchinson, G. Evelyn 'Knowledge Among Men' in Ripley, Dilton, Editor, Smithsonian Institution Symposium. New York: Simon and Schuster, 1966.
- Hutchinson, Lt-Col G.S. The British Army. London: Gramol Publication 1945.
- Janoqitz, Morris The Professional Soldier: A Social and Political Portrait. New York Glencoe Press 1964.



- Jemibewon, Brigadier David M. A Combatant in Government  
Ibadan: Heinemann, 1978
- Josephus, Flavius The Wars of the Jews, translated  
by William Whiston, London.  
J.M.Dent & Sons 1915.
- Kira, Alexander The Bathroom. New York. Bantam Books  
1967.
- Keay, R.W.J. An Outline of Nigerian Vegetation  
Lagos, 1949.
- Lerup, Lars Building the Unfinished Architecture  
and Human Action. London: Sage 1977
- Lieberman, B., 'Combining Individual Preferences  
into a social choice' in Buchler  
I.R. and Nutini, H.G., editors  
Games Theory in Behavioural  
Sciences. Pittsburgh University of  
Pittsburgh Press 1969.
- Luckham, Robin The Nigerian Military, London:  
Cambridge University Press, 1971.
- Madge, John Tools of Social Science, London:  
Longman 1953
- Masland, John W., and Radway  
Lawrence I. Soldiers and Scholars. Princeton N.J.  
Princeton University Press 1957.
- Maslow A.H. Motivation and Personality. New  
York Harper and Brothers 1954
- McGuffie, T.H. Rank and File: The Common Soldier at  
peace and war (1642-1914) London:  
Hutchinson, 1964.
- Moser, C.A., and Kalton G., Surrey Methods in Social  
Investigation London: Heinman  
Educational Press 1971.
- Myatt, Frederick The British Infantry 1660-1945  
Poole Dorset: Blanford Press 1983.
- Mabogunfe, A.L. Urbanization in Nigeria. London:  
Routledge and Kegan Paul 1950.
- Nef, J.U. War and Human Progress: London:  
Routledge and Kegan Paul 1950.
- Newman, Oscar Defensible Space: Crime prevention  
through Urban Design. New York  
Macmillan, 1972.

Nigeria	<u>The Economic Programmes for the Federation of Nigeria, 195-60, Lagos</u> Federal Government Printers, 1955.
Nigeria	<u>First and Second Progress Report of Economic Programme.</u> Lagos: Federal Government Printers, 1957.
Nigeria	<u>Third report of Economic Programme</u> Lagos: Federal Government Printers 1958.
Nigeria	<u>Our Military Forces</u> Lagos: Federal Information Service, 1957.
Nigeria	<u>Report of Accountant General 1960-66</u> Lagos: Federal Government Printers 1966.
Nigeria	<u>House of Representative Debates</u> 1963. Lagos: Federal Government Printers 1964.
Patton Jr. General G.S.	<u>War As I knew It.</u> London: W.H. Allen 1949.
Perin, Constance	<u>With Man in Mind</u> Massachusetts: MIT Press 1970.
Rapoport, Amos	<u>House form and Culture.</u> New Jersey Prentice - Hall 1969.
Roberts S.H.	<u>History of French Colonial Policy</u> Oxford University Press, 1929.
Rothenberg G.E.	<u>The Army of Francis Joseph, Lafayette:</u> Purdue University Press, 1976.
Smith, Adam	<u>An Inquiry into the Nature and Causes of Wealth of Nations</u> 3 Volumes Dublin: Messrs. Whitestone, 1776.
Sommer, Robert	<u>Personal Space the behavioural basis of design.</u> New Jersey: Prentice-Hall 1969.
Stotz, Charles Morse	<u>Drums in the forest,</u> Pittsburgh Pittsburgh Press 1958.
Stouffer, Samuel A et al	<u>The American Soldier: Studies in social Psychology of World War II.</u> Princeton N.J.: Princeton University Press 1949.
Shankland Cos. Partnership	<u>Third World Urban Housing</u> Watford: Building Research Establishment 1972.
United Nations	<u>Report of the UN Technical Assistance Housing Mission to Ghana</u> Geneva 1957.

- United Nations The Growth of World Industry  
New York 1969.
- Vagts, Alfred A History of Militarism New York:  
Free Press, 1959.
- Van Der Ryn, Sim and  
Silverstein Murray Dorms in Berkeley Berkeley:  
University of California Press  
1967.
- Vincent C.E. 'Mental Health and the Family' in  
Glasser P.H. and Glasser, L.N.  
editors, Families in Crisis New York  
Harper and Row, 1970.
- Wallbank F.W. A Historical Commentary on Polybius  
Oxford: University Press 1957.
- Watson G.R. The Roman Soldier London: Thames  
and Hudson 1969.
- Webster, Graham The Roman Imperial Army of 1st and  
2nd Centuries AD. London: Adam and  
Charles Black 1969.
- West Africa Report of the West African Forces  
Conference Lagos 20-24th April  
1953. HMSO, 1954.
- Wilson, Robert 'Livability of the City, attitudes  
and Urban Development' in Chapin  
F.G. editor Urban Growth Dynamics  
in a Regional Cluster of Cities  
New York: John Wiley, 1962.
- Wilson, Roger Roman Forts. London: Bergstrom and  
Boyle 1980.

PERIODICALS, REPORTS AND OTHER SOURCES

Army Sanitary Committee

Report of the Army Sanitary Committee (1866) unpublished report, Royal Corps of Engineer library Chatham.

Baldwin, Brigadier H.W.

The Development , Training and operations of the West African Engineers and the operations of works Services in West Africa to 1949 Unpublished manuscript, Royal Corps of Engineers Library, Chatham.

Barracks Commission

Report of the Barracks and Hospital Improvement Commission (1861) Unpublished report Royal Corps of Engineers library, Chatham.

Barclay, Brigadier C.N.

'The Indian Army' Army July 1967 52-58

Christie R.

'Changes in authoritarianism as related to situational factors' American Psychology 7, (1952) 302-308.

Canter, David

'The Purposive Evaluation of places a facet approach in Environment and Behaviour Vol15 No.6 (November 1983) 659-698

Densham- Booth, Lt-Col D.F.

Social Planning in the 1970's and 80's unpublished report Royal Corps of Engineer library, Chatham (1970)

Director of Works (Army)

The Modular Suite. unpublished report, Property Services Agency Library Edinburgh(1983)

Eayr, James

'Future roles of the Armed forces of Canada' in Foreign Policy Review 27 (April 1969)

Fabircius, E.

'Some Notes on Polybius' Description of Roman Camps' Journal of Roman Studies 22 (1932) 78-87.

Hartnag<sup>e</sup>al T.F.

'Absent Without Leave: A Study of the Military Offender in Journal of Political and Military Sociology 2, (1974) pp. 205-220

Hoinville, G.

'Evaluating Community Preferences' in Environment and Planning 3, (1971) pp 33-50.

Hoinville G and  
Jewell, R.

'Will the real Public Please Stand Up?' in Official Architecture and Planning March 1972) pp 159-161.

India~~n~~ Office Records

'Hutting Accommodation for Native Troops' L/MIL/7/13220, Collection 293.

India~~n~~ Office Records

Army Dispatch No.40 1912, L/MIL/7/13225.

India~~n~~ Office Records

Army Regulations, India VolXII L/MIL/17/5/633

Landing, J.B., and Masons R.W.

'Evaluation of Neighbourhoods', Journal of American Institute of Planners, 35, (1969) 195-199

Loring jr. William C.

'Housing Characteristics and Social Disorganisation' Social Problems V 14 No.3 (January 1956) 164-166

Ludrigson, Eric C

'Everyone talks about family Housing, But...' Army March 1970 25-29

Lyman, S.M., and Scott M.B.

'Territoriality: A neglected Sociological dimension'. Social Problems, Vol15, No.2 (1967) 236-249.

Michelson W.

'An Empirical Analysis of Urban Environmental Prefernces' Journal of American Institute of Planners 32 (1966) 55-60.

Michelson W.

'Urban Sociology as an Aid to Urban Physical Development: Some research Strategies'. Journal of American Institute of Planners. (March 1968)

Miller G.A.

'The Magical Number Seven, plus or minus two. Some limits on our capacity for processing information.' Psychological Review 63, (2) (1956) 81-97.

- Owens, A. 'Job satisfaction and re-engagement among Australian Regular ARmy Soldiers'. Australian Journal of Psychology 21, (1969) 137-1144
- Ravetz A., 'The Use of Surveys in the Assessment of Residential Design Art 1/3 (April 1971)
- Rowley G., and Tipple, G 'Coloured Immigrants within the City An analysis of housing and travel preferences. Urban Studies 11 (1974) 81-89
- Royal Commission Report of the Royal Commission on the Sanitary State of the Army 1858 unpublished report Royal Corps Engineer library, Chatham.
- Schqartz Barry 'The Social Psychology of Privacy American Journal of Sociology 73, (May 1968) 41 - 52.
- Scott-Moncrieff Major 'Occassional Paper VII'. Corps of Royal Engineers Professional Papers, 2 (1895) 125-136.
- Shils, E.A. and Janowitz M. 'Cohesion and Disintegration in the Wehrmacht in World War II, Public Opinion Quarterly 12 (Summer 1948).



Turner John C.

'Barriers and Channels for Housing  
Development in Modernizing Countries  
Journal of American Institute  
of Planners 33 (May 1967) 167-181

Van Der Ryn, S and  
Silverstein M.

'Berkeley: How do Students really  
live? Architectural forum (July-  
August, 1967) 91-97

Walter, M.N.

'Observation on rainfall at the  
Institute for Agricultural Research'  
Samarn Miscellaneous Paper No.15  
A.Bill. Zaria 1967.

West Africa Command,  
Office of the Chief  
Royal Engineer

West Africa Command: Post War  
Planning. Unpublished Paper  
Royal Corps of Engineers Library  
Chatham.

APPENDIX I

BARRACK HOUSING FOR SOLDIERS

QUESTIONNAIRE

1. State your rank.....

2. What is your highest educational qualification?

- i. none (.....)
- ii. primary (.....)
- iii. secondary (.....)
- iv. diploma or  
equivalent (.....)
- v. degree (.....)

3. Are you married?

- i. yes (.....)
- ii. no (.....)

4. (a) Indicate type of quarters you presently occupy

- i. 10/12 family  
block (.....)
- ii. 30/36 family  
block (.....)
- iii. semi-detached  
house (.....)
- iv. detached  
house (.....)
- v. flat (.....)

(b) How many persons live with you in your present quarters  
by ages?

- i. ages 0-5 (.....) v. 20-30 (.....)
- ii. 6-10 (.....) vi. 31-40 (.....)
- iii. 11-15 (.....) vii. 41-50 (.....)
- iv. 16-19 (.....) Total (.....)

5. How many bedrooms does your quarters contain?

- i. one bedroom (.....)
- ii. two bedrooms (.....)
- iii. three or more bedrooms (.....)

6. How many living rooms/parlours does your quarters contain?

- i. none (.....)
- ii. one room used solely  
for living (.....)
- iii. one room used both  
for living and  
sleeping (.....)
- iv. two or more rooms (.....)

7. Do you have a toilet for the exclusive use of your household?

- i. yes (.....)
- ii. shared (.....)
- iii. none (.....)

8. Do you have a kitchen for the exclusive use of your household?

- i. yes (.....)
- ii. shared (.....)
- iii. none (.....)

9. Do you have a bathroom for the exclusive use of your household?

- i. yes (.....)
- ii. shared (.....)
- iii. none (.....)

10. (a) Is there a space provided for storage in your quarters?

- i. yes (.....)
- ii. no (.....)

11. (a) Do you have difficulty storing any of your belongings  
either military or personal?

- i. yes (.....)
- ii. no (.....)
- iii. don't know (.....)

(b) If yes, what do you find difficult to store?

- i. military issues (.....)
- ii. personal property (.....)
- iii. both(i) and (ii) (.....)
- iv. nothing (.....)

12. (a) Where do you usually do your washing?

- i. bathroom (.....)
- ii. outside in the open space (.....)
- iii. outside the barrack (.....)
- iv. elsewhere (specify).....

(b) Where do you usually dry your washing?

- i. bathroom (.....)
- ii. railings (.....)
- iii. on the ground outside (.....)
- iv. elsewhere (.....)

(c) On the whole would you say that washing and drying your washing was

- i. no problem (.....)
- ii. rather a problem (.....)
- iii. a great problem (.....)
- iv. don't know (.....)

(d) if a problem, what is the problem?

.....  
.....

13. (a) Would you like to have a private backyard?

- i. yes (.....)
- ii. no (.....)
- iii. don't know (.....)

(b) Why?

.....

14. Which of the following do you own in your quarter?

- i. radio/cassette recorder (.....)
- ii. record player (.....)
- iii. TV (.....)
- iv. sewing machine (.....)
- v. electric fan (.....)
- vi. refrigerator (.....)

15. (a) Summing up your feelings about your quarter you presently live, would you say you are..

- i. very satisfied (.....)
- ii. satisfied (.....)
- iii. indifferent (.....)
- iv. dissatisfied (.....)
- v. very dissatisfied (.....)
- vi. don't know (.....)

(b) Why?

.....

16. What type of quarter would you prefer to live in?

- i. detached (.....)
- ii. semi-detached (.....)
- iii. flat (.....)
- iv. 10/12 family block (.....)
- v. any other (specify) (.....)

17. Which form of transportation do you own?

- i. car (.....)
- ii. motorcycle (.....)
- iii. bicycle (.....)
- iv. none (.....)

18. (a) Summing up your feelings about the barrack outside your quarter, would you say you are

- i. very satisfied (.....)
- ii. satisfied (.....)
- iii. indifferent (.....)
- iv. dissatisfied (.....)
- v. very dissatisfied (.....)
- vi. don't know (.....)

(b) Why?.....

19. Indicate how satisfied you are with the following in your present quarters.

	very satisfied	satisfied	indifferent	dis-satisfied	very dis-satisfied
appearance of qtrs.					
Bedrooms					
Livingroom/parlour					
Kitchen					
Layout of Rooms					
Toilet/Bathroom					

20. Indicate how important you consider the following in an ideal barrack barrack quarters

	very important	important	in-different	not important
appearance of qrts				
Larger living room				
more Bedroom space				
Back yard				
Larger kitchen with private outdoor cooking space				
layout of rooms				
store				
Children private outdoor play area				



21. Indicate how satisfied you are with the following in your barrack.

	very satisfied	satisfied	indif- ferent	dis- satisfied	very dis- satisfied
privacy from neighbours					
Layout of buildings					
Recreational facil- ities					
Trees near house					
public transport					
FIRE protection					
Market/shops					
maintenance					
Refuse collection					

22. Indicate how important you consider the following in an ideal barrack

	very important	important	in-different	not important
privacy from neighbours				
fire protection				
recreational faci- lities				
public transport				
market/shops				
layout of buildings				

22a. Indicate how important you consider the following in an ideal barrack.

	very important	important	in-different	not important
maintenance				
Refuse collection				
Children playground				
Trees near house				

23. If you are required to start paying for rent of quarters in order to have an ideal quarter, how much will you be prepared to pay?

- i. nothing (.....)
- ii. NO-N10 (.....)
- iii. N11-N20 (.....)
- iv. N21-N30 (.....)
- v. any amount  
asked for (.....)
- vi. don't know (.....)

PRIORITY EVALUATION GAME

1. BEDROOM

- (a) small bedroom (.....)
- (b) large bedroom (.....)
- (c) additional bedroom (.....)

2. HOUSE TYPE

- (a) multi-family block (.....)
- (b) semi-detached (.....)
- (c) detached (.....)

3. YARD

- (a) none (.....)
- (b) backyard (.....)
- (c) frontyard + backyard (.....)

4. BATHROOM/TOILET

- (a) small bathroom/toilet (.....)
- (b) larger bathroom/toilet (.....)
- (c) separate rooms (.....)

5. STORAGE SPACE

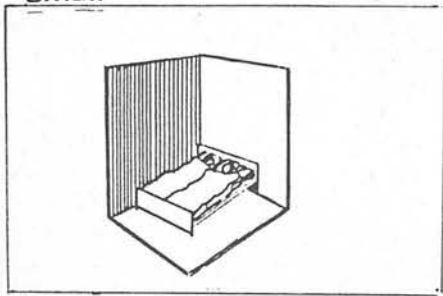
- (a) none (.....)
- (b) built-in wardrobe (.....)
- (c) separate store room (.....)

6. CHILDREN PLAY AREA

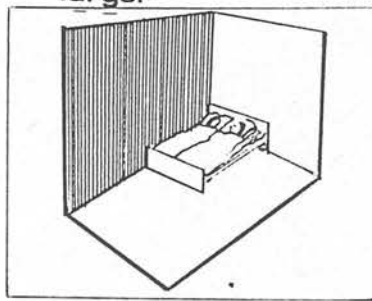
- (a) on the roads (.....)
- (b) area adjacent to qrts (.....)
- (c) an elaborate play-ground for the barrack (.....)

# 1 BEDROOM

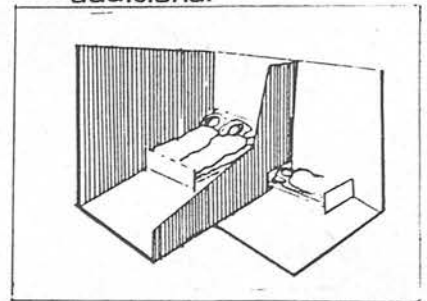
small



larger

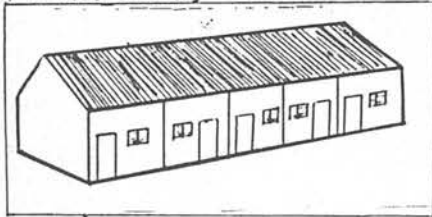


additional

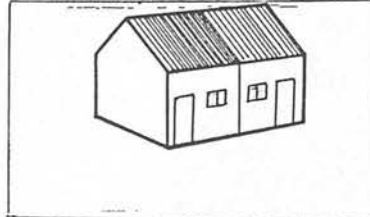


# 2 HOUSE TYPE

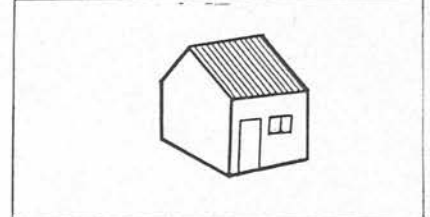
multi-family block



semi-detached

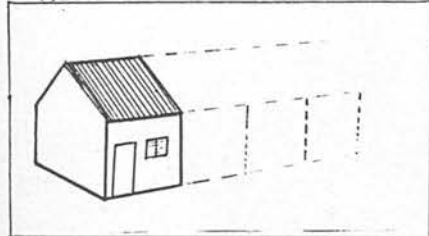


detached

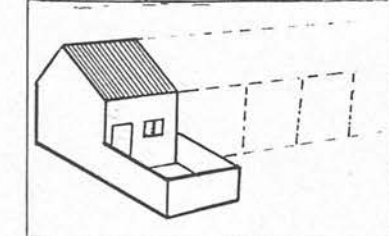


# 3 YARD

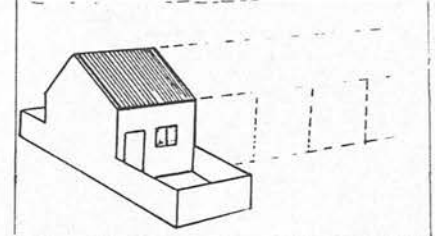
none



backyard

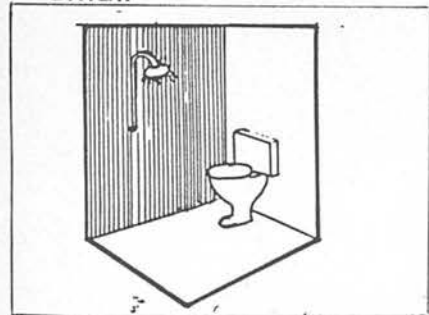


front + back yard



# 4 BATHROOM/TOILET

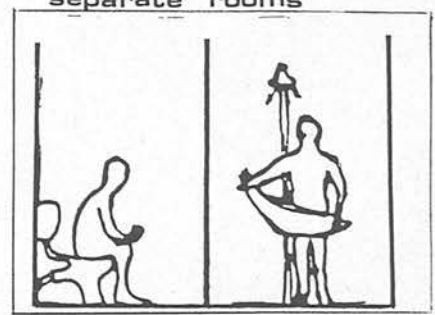
small



larger

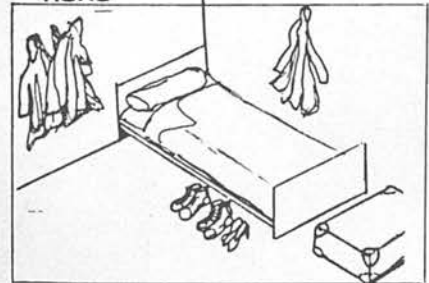


separate rooms

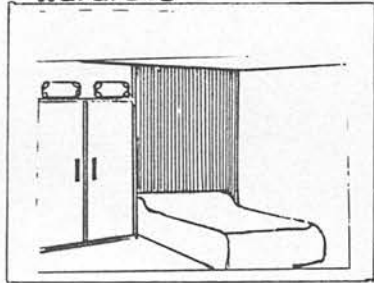


# 5 STORAGE SPACE

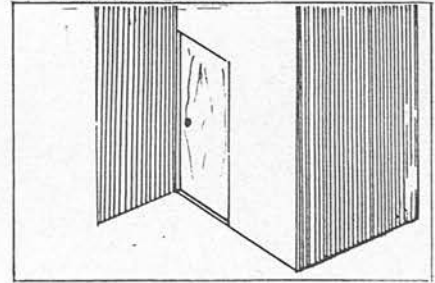
none



wardrobe

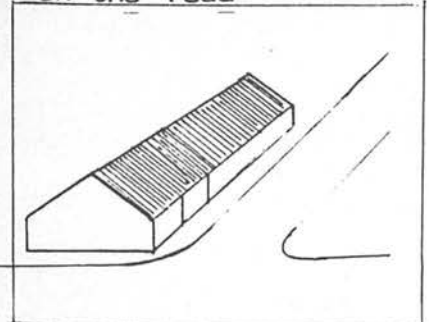


storeroom

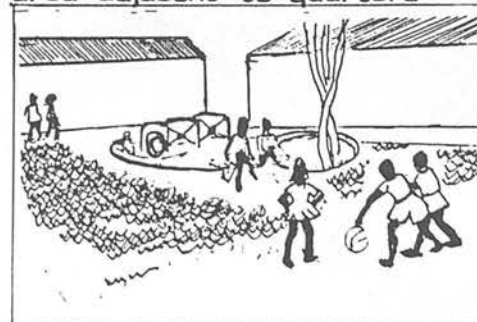


# 6 CHILDREN PLAYAREA

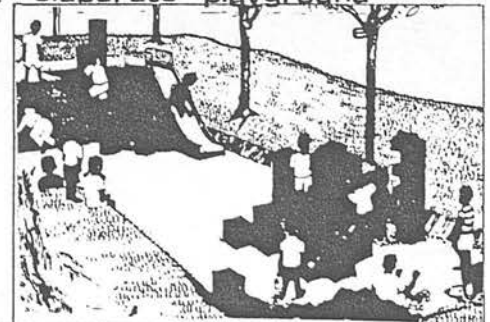
on the road



area adjacent to quarters



elaborate playground



APPENDIX II

TABULATED RESULTS

Table I      Sample by Rank

Rank	Number	Percentage	Cumulative percentage
Private	89	30.2	30.2
Lance Corporal	68	23.0	53.2
Corporal	63	21.4	74.6
Sergeant	53	17.9	92.5
Warrant Officers	22	7.5	100.0
Total	295	100.0	

Table II      Educational Level

Type	Number	Percentage	Cumulative percentage
None	6	2.0	2.0
Primary <sup>+</sup>	190	64.4	66.4
Secondary or equivalent	95	32.2	98.6
Diploma or equivalent	4	1.4	100.0
Degree or equivalent	0	0.0	
Total	295	100.0	

+ includes those who did not actually complete the primary education

TABLE III      Marital Status

	Number	Percentage	Cumulative Percentage
Married	233	79.0	79.0
Not Married	62	21.0	100.0
Total	295	100.0	

TABLE IV      Household Size

Type	Number	Percentage	Cumulative percentage
1	57	19.3	19.3
2	13	4.4	23.7
3	33	11.2	34.9
4	44	14.9	49.8
5	42	14.2	64.0
6	30	10.3	74.3
7	31	10.5	84.8
8	21	7.2	92.0
9	13	4.4	96.4
10+	11	3.6	100.0
TOTAL	295	100.0	

TABLE V      Household members by Ages

Age Group	Age in years	Total No. (in sample)	Mean	Percentage	Cumulative percentage
C1	0 - 5	405	1.373	29.5	29.5
C2	6 - 13	299	1.014	21.8	51.3
C3	14 - 19	121	0.410	8.8	60.1
A	20	547	1.854	39.9	100.0
TOTAL		1372	4.65	100.0	100.0

TABLE VI      Table of quarters occupied

Type	Number	Percentage	Cumulative percentage
10/12 family block	182	61.7	61.7
30/36 family block	89	30.2	91.9
Semi-detached house	20	6.8	98.7
Flats	4	1.3	100.0
Detached house	0	0	100.0
Total	295	100.0	



TABLE VII      Number of bedrooms in the quarters

Type	Number	Percentage	Cumulative percentage
One Bedroom	257	87.1	87.1
two Bedrooms	38	12.9	100.0
TOTAL	295	100.0	

TABLE VIII    Type of Living room/parlour

Type	Number	Percentage	Cumulative percentage
none	33	11.2	11.2
one for living only	54	18.3	29.5
one for living/sleep	208	70.5	100.0
Total	295	100.0	

TABLE IX      Toilet/Bathroom facility for Household

Type	Number	Percentage	Cumulative percentage
shared	112	38.0	38.0
one exclusive for household	183	62.0	100.0
Total	295	100.0	

TABLE X      Kitchen for household

Type	Number	Percentage	Cumulative percentage
shared	36	12.2	12.2
one exclusive for household	259	87.8	100.0
Total	295	100.0	

TABLE XI      Storing difficulty

	Number	Percentage	Cumulative Percentage
Yes	257	87.1	87.1
No	37	12.6	99.7
Don't know	1	0.3	100.0
Total	295	100.0	

TABLE XII      Items difficult to store

Item	Number	Percentage	cumulative Percentage
Military issue	6	2.0	2.0
Military and personal property	251	85.1	87.1
Nothing	38	12.9	100.0
Total	295	100.0	

TABLE XIII      Washing space

Place Used	Number	Percentage	Cumulative Percentage
Bathroom	90	30.5	30.5
open space adjacent to block	202	68.5	99.0
elsewhere	3	1.0	100.0
Total	295	100.0	

TABLE XIV      Drying Space

Placed used	Number	Percentage	Cumulative percentage
Bathroom	15	5.1	5.1
balcony railings	15	5.1	10.2
open space adjacent to block	265	89.8	100.0
Total	295	100.0	

TABLE XV      Washing and Drying problem

Attitude	Number	Percentage	Cumulative percentage
no problem	38	12.9	12.9
rather a problem	253	85.8	98.6
a great problem	3	1.0	99.6
don't know	1	0.4	100.0
TOTAL	295	100.0	

TABLE XVI      Desirability of private back yard

Attitude	Number	Percentage	Cumulative percentage
desired	293	99.3	99.3
not desired	2	0.7	100.0
Total	295	100.0	

TABLE XVII      Possession of Household items

a.      Radio Cassette recorder

Situation	Number	Percentage
own	236	80.0
none	59	20.0
Total	295	100.0

b.      Record Player

own	134	45.4
none	161	54.6
Total	295	100.0

c.      Television

Own	194	65.8
none	101	34.2
Total	295	100.0

d.      Electric fan

own	275	93.2
none	20	6.8
Total	295	100.0

e.      Refrigerator

own	129	43.7
none	166	56.3
Total	295	100.0

TABLE XVIII      General satisfaction with Quarters

Rate of satisfaction	number	percentage	cumulative percentage
very dissatisfied	7	2.4	2.4
dissatisfied	141	47.8	50.2
indifferent	42	14.2	64.4
satisfied	103	34.9	99.3
very satisfied	2	0.7	100.0
Total	295	100.0	

TABLE XIX      Quarters type preferred

Type	Number	percentage	cumulative percentage
detached	76	25.8	25.8
semi-detached	207	70.2	96.0
block of flats	11	3.7	99.7
multifamily block	1	0.3	100.0
Total	295	100.0	

TABLE XX      Means of transportation

Type	Number	percentage
Car	11	3.7
Motorcycle	68	23.7
Bicycle	31	10.5
None	185	62.7
Total	295	100.0

TABLE XXI      General Satisfaction with Barrack environment

rate of satisfaction	Number	Percentage	Cumulative percentage
Very dissatisfied	4	1.4	1.4
dissatisfied	208	70.5	71.9
indifferent	78	26.4	98.3
satisfied	5	1.7	100.0
Total	295	100.0	

TABLE XXII      Satisfaction with quarters appearance

rate of satisfaction	number	Percentage	Cumulative percentage
Dissatisfied	149	50.5	50.5
indifferent	57	19.3	69.8
satisfied	89	30.2	100.0
Total	295	100.0	

TABLE XXIII      Satisfaction with Bedrooms

Rate of satisfaction	number	Percentage	Cumulative percentage
dissatisfied	125	42.4	42.4
indifferent	121	41.0	83.4
satisfied	49	16.6	100.0
Total	295	100.0	



TABLE XXIV      Satisfaction with living room/parlour

rate of satisfaction	number	percentage	cumulative percentage
dissatisfied	67	22.7	22.7
indifferent	82	27.8	50.5
satisfied	146	49.5	100.0
Total	295	100.0	

TABLE XXV      Satisfaction with Kitchen

rate of satisfaction	Number	percentage	cumulative percentage
dissatisfied	65	22.0	22.0
indifferent	91	30.8	52.8
satisfied	139	47.2	100.0
TOTAL	295	100.0	

TABLE XXVI      Satisfaction with layout of rooms

rate of satisfaction	Number	Percentage	cumulative percentage
Dissatisfied	258	87.4	87.4
Indifferent	19	6.4	93.8
Satisfied	18	6.2	100.0
Total	295	100.0	

TABLE XXVII      Satisfaction with Toilet/bathroom

rate of satisfaction	Number	percentage	cumulative percentage
dissatisfied	134	45.4	45.4
indifferent	128	43.4	88.8
satisfied	33	11.2	100.0
Total	295	100.0	

TABLE XXVIII    Importance of Appearance of quarters

Degree of Importance	Number	Percentage	cumulative percentage
Very important	97	32.9	32.9
important	191	64.7	97.6
indifferent	7	2.4	100.0
Total	295	100.0	

TABLE XXIX      Importance of Living room size

Degree of importance	Number	percentage	cumulative percentage
Very important	6	2.10	2.10
Important	52	17.6	19.70
indifferent	234	79.3	99.0
Not important	3	1.0	100.0
Total	295	100.0	

TABLE XXX      Importance of Bedroom Size

Degree of importance	number	percentage	cumulative percentage
Very important	242	82.0	82.0
important	52	17.7	99.7
indifferent	1	0.3	100.0
TOTAL	295	100.0	

TABLE XXXI      Importance of Back Yard

Degree of Importance	Number	percentage	cumulative percentage
Very important	295	100.0	
Total	295	100.0	

TABLE XXXII      Importance Kitchen with outdoor cooking space

Degree of importance	Number	percentage	cumulative percentage
Very important	12	4.1	4.1
important	279	94.6	98.7
indifferent	4	1.3	100.0
Total	295	100.0	

TABLE XXXIII      Importance of room layout

Degree of Importance	Number	percentage	cumulative percentage
Very important	216	73.3	73.3
Important	78	26.4	99.7
Indifferent	1	0.3	100.0
Total	295	100.0	

TABLE XXXIV      Importance of Storage Space

Degree of importance	Number	percentage	cumulative percentage
Very important	295	100.0	
Total	295	100.0	

TABLE XXXV      Importance of Children play space

Degree of Importance	Number	percentage	cumulative percentage
Very important	99	33.6	33.6
important	193	65.4	99.0
Indifferent	3	1.0	100.0
Total	295	100.0	

TABLE XXXVI      Satisfaction with privacy from neighbours

Rate of Satisfaction	Number	Percentage	cumulative percentage
Dissatisfaction	268	90.8	90.8
Indifferent	11	3.7	94.5
Satisfied	16	5.5	100.0
Total	295	100.0	

TABLE XXXVII      Satisfaction with layout of buildings

Rate of satisfaction	Number	Percentage	cumulative percentage
Dissatisfied	268	90.8	90.8
Indifferent	24	8.2	99.0
Satisfied	3	1.0	100.0
Total	295	100.0	

TABLE XXXVIII      Satisfaction with recreational facilities

Rate of satisfaction	Number	percentage	cumulative percentage
Dissatisfied	275	93.2	93.2
Indifferent	20	6.8	100.0
Total	295	100.0	

TABLE XXXIX      Satisfaction with landscape

Rate of satisfaction	Number	percentage	cumulative percentage
Dissatisfied	168	57.0	57.0
Indifferent	127	43.0	100.0
Total	295	100.0	

TABLE XL      Satisfaction with public transport

Rate of Satisfaction	Number	percentage	cumulative percentage
Dissatisfied	54	18.3	18.3
Indifferent	241	81.7	100.0
Total	295	100.0	

TABLE XLI      Satisfaction with fire protection

Rate of Satisfaction	Number	percentage	cumulative percentage
Dissatisfied	66	22.4	22.4
Indifferent	225	76.2	98.6
Satisfied	4	1.4	100.0
Total	295	100.0	

TABLE XLII      Satisfaction with market/shops

Rate of satisfaction	Number	percentage	cumulative percentage
Dissatisfied	126	42.7	42.7
Indifferent	167	56.6	99.3
Satisfied	2	0.7	100.0
Total	295	100.0	

TABLE XLIII      Satisfaction with maintenance

Rate of satisfaction	Number	percentage	cumulative percentage
Dissatisfied	205	69.5	69.5
Indifferent	88	29.8	99.3
Satisfied	2	0.7	100.0
Total	295	100.0	

TABLE XLIV      Satisfaction with Refuse Collection

Rate of satisfaction	Number	percentage	cumulative percentage
Dissatisfied	161	54.6	54.6
Indifferent	126	42.7	97.3
Satisfied	8	2.7	100.0
Total	295	100.0	

TABLE XLV      Importance of Privacy from neighbours

Degree of Importance	Number	percentage	cumulative percentage
Very important	252	85.4	85.4
Important	43	14.6	100.0
Total	295	100.0	



TABLE XLVI     Importance of Building Layout

Degree of Importance	Number	percentage	cumulative percentage
Very important	225	76.3	76.3
Important	70	23.7	100.0
Total	295	100.0	

TABLE XLVII     Importance of recreational facilities

Degree of importance	Number	percentage	cumulative percentage
Very important	237	80.3	80.3
Important	58	19.7	100.0
Total	295	100.0	

TABLE XLVIII     Importance of Landscaping

Degree of Importance	Number	percentage	cumulative percentage
Very important	134	45.4	45.4
Important	157	53.2	98.6
Indifferent	4	1.4	100.0
Total	295	100.0	

TABLE XLIX     Importance of public transport

Degree of importance	Number	percentage	cumulative percentage
Very important	76	25.8	25.8
Important	187	63.4	89.2
Indifferent	31	10.5	99.7
Not Important	1	0.3	100.0
Total	295	100.0	

TABLE L     Importance of Fire protection

Degree of Importance	Number	percentage	cumulative percentage
Very important	193	65.4	65.4
important	102	34.6	100.0
Total	295	100.0	

TABLE LI     Importance of market/shops

Degree of Importance	Number	percentage	cumulative percentage
Very important	159	53.9	53.9
Important	135	45.8	99.7
Indifferent	1	0.3	100.0
Total	295	100.0	

TABLE LII     Importance of Maintenance

Degree of Importance	Number	percentage	cumulative percentage
Very important	282	95.6	95.6
Important	13	4.4	100.0
Total	295	100.0	

TABLE LIII     Importance of Children playground

Degree of importance	Number	percentage	cumulative percentage
Very important	57	19.3	19.3
important	233	79.0	98.3
Indifferent	5	1.7	100.0
Total	295	100.0	

TABLE LIV Importance of refuse collection

Degree of importance	Number	percentage	cumulative percentage
Very important	141	47.8	48.7
Important	134	52.2	100.0
Total	295	100.0	

TABLE LV Rent for Quarters if affected

Amount	Number	percentage	cumulative percentage
Nothing	15	5.1	5.1
NO - N10	96	32.5	37.6
N11 - N20	133	45.1	82.7
N21 - N30	12	4.1	86.8
any amount charged	39	13.2	100.10
Total	295	100.0	

TABLE LVI Priority Evaluation Game - points allocated to each desired situation

Situation	Points
separate store room	326
backyard	286
additional bedroom	284
separate rooms for toilet/ bathroom	228
large bedroom	144
built in wardrobe	132
children play space adjacent to quarters	131
semi-detached house	112
larger bathroom/toilet	102
front yard and backyard	18
detached house	6

N = 295

EDINBURGH COLLEGE OF ART
HERIOT-WATT UNIVERSITY
DEPARTMENT OF TOWN PLANNING
ACCESSION No. <u>231598</u>
CLASS <u>REF</u>
SUPPLIER .....
PRICE .....